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ABSTRACT

We examine whether the behavior of current account balances changed in the years preceding the global crisis of 2008-09, and assess the prospects for global imbalances in the post-crisis period. Changes in the budget balance are an important factor affecting current account balances for deficit countries such as the U.S. and the U.K. The effect of the "saving glut variables" on current account balances has been relatively stable for emerging market countries, suggesting that those factors cannot explain the bulk of their recent current account movements. We also find the 2006-08 period to constitute a structural break for emerging market countries, and to a lesser extent, for industrialized countries. We attribute the anomalous behavior of pre-crisis current account balances to stock market performance and real housing appreciation; fiscal procyclicality and the stance of monetary policy do not matter as much. Household leverage also appears to explain some of the standard model's prediction errors. Looking forward, U.S., fiscal consolidation alone cannot induce significant deficit reduction. For China, financial development might help shrink its current account surplus, but only when it is coupled with financial liberalization. These findings suggest that unless countries implement substantially more policy change, global imbalances are unlikely to disappear.

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1. Introduction

The prospects for the world economy remain murky at best. Yet it is not too early to examine the question whether global imbalances, specifically large current account deficits and surpluses, were important causes of the financial crisis of 2008. Recall, of the many explanations that have been forwarded -- ranging from lax financial regulation, skewed incentives associated with corporate governance, over-leveraging, securitization, and the actions of the Government Sponsored Enterprises, to the conflict of interest problems faced by the ratings agencies, to excessively lax monetary policy – the excess of savings originating from East Asia and the oil exporters have occupied a central role in certain circles.

Former Fed Chairman Greenspan argued that global imbalances were a key factor in the crisis. The easy access to savings from China, Japan and Germany encouraged profligacy in the deficit countries, most notably the United States and the United Kingdom. Asset bubbles and busts were the consequence.[1]

With the passage of time, additional data relevant for identifying the determinants of imbalances have become available. Earlier studies, including Chinn and Ito (2007, 2008), did not have available to them information on the determinants of savings, investment and current account balance during the crisis. The objective of this study is therefore to update those earlier analyses and ask whether the determinants of global imbalances have changed. It is to inquire into the prospects for (dangers of) renewed imbalances are going forward.

We do not regard this as a postmortem on the crisis. Instead, we treat our investigation as a prospective forensic analysis, aimed at preventing a repetition. We use out of sample forecasting exercises to ask whether there is a danger that the United States will return to its spendthrift ways, and that China, Japan, and other East Asian economies will provide it with the finance needed to do so.

We focus on the proximate determinants of global imbalances prior to and during the crisis years. Using projections of those determinants, we then undertake a series of forecasting exercises. Finally we consider how capital flows and current account balances are likely to evolve under different scenarios.

More specifically:

[1] Council of Economic Advisers (2009) is the most comprehensive explication of this view.

1) We reexamine the determinants of current account balances, savings and investment using a variant of the model developed by Chinn and Prasad (2003) and Ito and Chinn (2009);
2) We investigate whether there is a structural break in the relationship between global imbalances and its proximate determinants around the time of the crisis. To shed further light on the global imbalances, we will examine the determinants of the "excessive imbalances" of current account balances;
3) Finally, we make some forecasts on the current account balances for the countries that ran major current account imbalances prior to the global crisis, and ask whether global imbalances between the U.S. and East Asia are likely to reemerge going forward.

In the course of this analysis we will consider several familiar, not necessarily mutual exclusive, hypotheses and arguments that have been offered to explain global imbalances. These include the twin deficit hypothesis (Chinn 2005), the saving glut hypothesis (Greenspan, 2005a,b, Bernanke, 2005, and Clarida, 2005), and the asset bubble driven explanation of current account balances (Aizenman and Jinjarak, 2009; Fratzscher and Straub, 2009).

2. Review of Competing Hypotheses

In the years from 1998-2008, economists focused their attention on the causes and consequences of the expanding current account deficits and surpluses. The pattern of current account balances was interesting from an economic standpoint, in that it did not appear to conform to what would be predicted by standard economic theories. They were troubling from a policy standpoint in that they were unprecedentedly large by post-war standards.
Throughout the first decade after 2000, the United States ran enormous current account deficits. China, the rest of East Asia, and the oil exporting countries ran correspondingly large current account surpluses. In 2008-09, these current account balances drastically reversed, albeit incompletely, as a global financial crisis engulfed the world economy (Figure 1). The proximity of the two events naturally leads to the question whether the two phenomena are related, or causal in nature.

The rise of global imbalances, defined as large current account balances, has been explained in a variety of ways. These explanations include (1) trends in saving and investment balances, (2) the intertemporal approach, (3) mercantilist behavior, (4) the global saving glut,

and (5) distortions in financial markets. Note that the explanations are far from mutually exclusive.

The saving-investment approach takes the perspective from the national saving identity which states that the current account is equal to the budget balance and the private saving-investment gap. This is a tautology, unless one imposes some structure and causality.

One particularly simple variant of this approach relies upon assuming that the shocks primarily hit the government sector. Then changes in the budget balance are quasi-exogenous, and the current account consequently responds. The inspiration for this perspective is the mid-1980's experience with the Reagan era tax cuts and defense buildup. During that episode, the budget deficit and current account deficits both yawned to unprecedentedly large magnitudes, inspiring the term "the twin deficits".

Upon inspection, the simple interpretation of the twin deficits clearly does not hold, beyond the mid-1980s, and 2001-2004 (Figure 2). Of course, other types of shocks perturb the economy, and once one allows for shocks to the other components of aggregate demand, or to the supply side, then no such positive correlation need hold at all times. However, that does not deny the validity of that view during the last decade.[2]

A systematic approach involves modeling the current account by explicitly focusing on the determinants of private investment and saving, and adding those variables to the budget balance. Chinn and Ito (2007, 2008) use a sample of developed and developing countries over the period 1971 to 2004 and control for a similar set of variables as used in Chinn and Prasad (2003). They find that government budget balances, initial net foreign asset positions and, for developing countries, indicators of financial deepening are positively correlated with current account balances. Among developing countries, they also find that higher terms of trade volatility is associated with larger current account surpluses (or smaller deficits). Greater macroeconomic uncertainty apparently increases domestic saving and also has a slightly negative impact on investment. The degree of openness to international trade appears to be weakly associated with larger current account deficits among developing countries.[3] Note that because they include average GDP growth and initial net foreign assets in the regressions, the saving-

[2] See for instance Chinn (2005). A dissenting view is Truman (2005). The September 2011 WEO also has a chapter on the twin deficits.

[3] They also find limited evidence to support the patterns of evolutions in current accounts predicted by the stages-of-development hypothesis. Other potentially important variables such as indicators of capital controls and average GDP growth, however, appear to bear little systematic relationship with current account balances.

investment approach is consistent with some aspects of the intertemporal approach (discussed below).[4]

Their key finding is that the budget balance is an important determinant of the current account balance for industrial countries; the coefficient for the budget balance variable is 0.15 in a model controlling for institutional variables. A series of robustness checks yield the results that a one percent point increase in the budget balance leads to a 0.1 to 0.5 percentage point increase in the current account balance.[5] For the United States, their analysis confirms the view that it is a saving drought – not investment boom – that is contributing to the enlargement of current account deficits, although there is some evidence of anomalous behavior in the 2001-04 period. For the East Asian countries, Chinn and Ito find some evidence that the current account balances are somewhat larger than predicted by their empirical models.

The intertemporal approach is the mainstay of the rigorous approach to explaining current account imbalances. In this perspective, consumption today is to equal a share of the present discounted value of future expected net output, or net wealth. Hence, changes in consumption are due solely to changes in either the interest rate, or changes in expectations about future net output due to productivity shocks or reductions in investment and government spending. The U.S. experience of the late 1990's can therefore be rationalized by an anticipation of a future productivity boom which induces a immediate increase in consumption, resulting in a current account deficit.[6] In the context of America in the 2000's, to consume more now means to import more and export less. The deficits leading up to the financial crisis of 2008-09 are more difficult to fit into this approach. A large proportion of capital flowing to the United States takes place in the form of purchases of U.S. government securities – not purchases of American stocks or direct investment in its factories, as it did in the years leading up to 2000. Moreover, the heavy involvement of foreign central banks in purchasing U.S. assets suggests that the profit motive was not behind the ongoing flows to the United States.[7]

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[4] Gruber and Kamin (2007) obtain similar results for a smaller panel of 61 countries spanning the 1982-2003 period. They find that including a crisis dummy for the East Asian countries statistically explains those countries' current account balances. However, their results do not shed light on the source of US deficits. Hence, while the stylized facts are relevant to the question at hand, they pertain to the period before the appearance of global imbalances.

[5] Smaller estimates of the fiscal impact are reported by Bussiere (2005), Corsetti and Muller (2006), and Gruber and Kamin (2007).

[6] See Pakko (1999) for an early interpretation in this vein. Note that the empirical evidence for the theoretical model underpinning this argument is weak. See Nason and Rogers (2006).

[7] There are numerous ways in which to account for intertemporal effects in current account dynamics. Chinn and Lee (2009) apply a structural VAR approach, which allows for transitory and permanent shocks to drive the current

A formal test of the intertemporal approach, as applied to the recent US experience, was conducted by Engel and Rogers (2006). They model the current account as a function of the expected discounted present value of its future share of world GDP relative to its current share of world GDP (where the world is the advanced economies). The key difficulty in testing this approach is in modeling expected output growth; using a Markov-switching approach, they find that the U.S. is not keeping on a long-run sustainable path.[8] [9]However, using survey data on forecasted GDP growth in the G-7, their empirical model appears to explain the evolution of the U.S. current account remarkably well.

Another prominent view attributes the East Asian surpluses to explicitly mercantilist behavior. From this perspective, the developing countries of East Asia have followed an export led development strategy. That export led strategy resulted in rapid growth; however, starting in the mid-1990's, current account surpluses evolved into current account deficits, as investment boomed.

In the wake of the 1997 financial crisis, investment levels collapsed, while saving rates remained relatively high. Currencies depreciated sharply in the region; however, over time, East Asian central banks maintained their currencies at fairly weak levels. For some observers, this observation is sufficient to explain the relatively large and persistent current account surpluses in the region. One difficulty with this explanation is that the export led development path has been in place for decades; the explanation for the sharp break post-1997 is missing.

Note that while the model explains one half of the current account imbalances, it does not explain the other side -- namely why it is that the United States, United Kingdom, and specific other developed countries ran substantial deficits. In a series of papers, Dooley, Folkerts-Landau, and Garber (2003; 2008) interpret the U.S. current account deficit as the outcome of concerted mercantilist efforts by East Asian state actors. In this context, the financing of America's trade (and budget) deficit is an explicit quid pro quo for continued access to American markets. Their explanation argues that the government interventions are aimed at supporting exporting industries.

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account and the real exchange rate. Using the same approach as in Lee and Chinn (2006), they examine the US, the euro area and Japan, and find that a large share of the 2004-07 US current account is inexplicable using their model.

[8] Engel and Rogers use data over the 1790-2004 period for one of their sustainability tests. The survey-based tests rely upon a shorter sample, 1994-2004.

[9] Choi, Mark and Sul (2008) allow for different rates of discount, and can replicate the pattern of imbalances in a two-country model.

There are also problems with this thesis. Most notable is the mysterious aspect of timing: East Asian savings began flowing to the United States in 2003. Why not earlier, if the mercantilist impetus had been there all along? For a thorough critique, see Prasad and Wei (2005). On the other hand, for emerging markets, Gagnon (2010) shows that current account balances are highly correlated with central bank official intervention.

An alternative interpretation for the large scale reserve accumulation has been attributed to the self-insurance or precautionary demand. Foreign exchange reserves can reduce the probability of an output drop induced by capital flight or sudden stop. This self-insurance motivation rose substantially in the wake of the East Asian crises; this point was verified by Aizenman and Marion (2003).[10] Aizenman and Lee (2007) evaluated the relative importance of these of the various motivations by augmenting the conventional specifications for reserve holdings with proxy variables associated with the mercantilism and self-insurance/precautionary demand approaches. While variables associated with both approaches are statistically significant, the self-insurance variables play a greater economic role in accounting for recent trends.

The "global saving glut" explanation has been expounded by Bernanke (2005), Clarida (2005a,b), and Hubbard (2005). This argument views excess saving from Asian emerging market countries, driven by rising savings and collapsing investment in the aftermath of the financial crisis (and to a lesser extent Europe), as the cause of the U.S. current account deficit. More recently, the burgeoning surpluses of the oil exporters, ranging from the Persian Gulf countries to Russia, have moved to the fore as sources of excess saving. From this perspective, the U.S. external imbalance is a problem made abroad; the lack of well-developed and open financial markets encourages countries with excess savings to seek financial intermediation in well-developed financial systems such as the United States. Hence, a solution may only arise in the longer term, as better developed financial systems mitigate this excess savings problem. Caballero, Farhi and Gourinchas (2008) model the saving glut explanation as a shortage of assets in the developing world. Mendoza, Quadrini and Rios-Rull model financial development as the increase in the degree of enforcement of financial contracts.

The strongest point in favor of the saving glut hypothesis is the observation of a widening current account deficit in the United States, combined with low real world interest rates. However, the saving glut versus twin deficits view is not an either-or proposition. An

[10] See also Aizenman and Lee (2007), and Jeanne and Ranciere (2005).

expansionary fiscal policy in the United States, combined with an investment drought in East Asia would yield the observed increase in current account imbalances, while at the same time resulting in a drop in the real interest rate. Thus, a simple open economy macro model can explain the recent rise in U.S. current account deficits, East Asian current account surpluses, and the recent fall in global interest rates without resort to exotic demand for high quality assets, or the like.

In order to formally test the saving glut hypothesis, one can evaluate whether financial development and institutional development explain the pattern of imbalances.

Using a structural model while controlling for the level of financial development and openness as well as institutional development, Chinn and Ito (2007) provide evidence against the argument that emerging market countries, especially those in East Asia, will experience lower rates of saving once these countries achieve higher levels of financial development and better developed legal infrastructure. In addition, more open financial markets do not appear to have any impact on current account balances for this group of countries.

Ito and Chinn (2009) examine whether their results are sensitive to the use of alternative indicators of financial development, namely measures of equity, bond, and insurance market activity, as well as different aspects of financial development such as the cost performance, size, and activeness of the industry. They find that credit to the private sector and stock market capitalization appear to be equally important determinants of current account behavior. While increases in the size of financial markets induce a decline in the current account balance in industrial countries, the reverse is more often the case for developing countries, especially when other measures of financial development are included. They also find that a greater degree of financial openness is typically associated with a smaller current account balance in developing countries.

On the other hand, in the Chinn and Ito papers, typically both the US current account deficit as well as the Chinese current account surplus were underpredicted. Hence, considerable gaps in our understanding of the origins of global imbalances remain.

Finally, we may apply the view of distortions in the financial market as one of the main causes of the global imbalances. In the context of the developing world, this view can be akin to or combined with the saving glut hypothesis. That is, financial market distortions in the developing world led countries to hold an excessive amount of national saving, which can be a

push factor for excess saving to flow to other countries with more developed financial markets. At the same time, financial distortions in the developed world can be a pull factor; financial distortions can cause irrational asset booms and pulled those flows from developing countries with excess savings to countries with institutional developed and open financial markets such as the United States.

With these push and full factors existent, risk can be underpriced. In such an environment, the reversed capital flows from developing to developed world – the Lucas paradox – can be long-lasting while both worlds appear to be mutually dependent and beneficial on the surface, until the bust of the cycle breaks out.

Irrationality, or waves of excess optimism and pessimism, is stressed by Akerlof and Shiller (2009). Stiglitz (2010) stresses the credit market imperfections associated with asymmetric information. Rent seeking and regulatory capture dominate the discussion by Johnson and Kwak (2010). Interestingly, excess saving from East Asia does not appear as a causal factor in any of these accounts. Roubini and Mihm (2010: 80-82) and Chinn and Frieden (2009; forthcoming) argue that excess rest-of-world saving combined with domestic financial distortions were central to the development and extent of the crisis.

The Chinn-Frieden interpretation is consistent with the view that a resumption of expanding imbalances without dealing with the distortions in credit markets would cause a repetition, albeit some other form. While the US has begun addressing some of those market distortions in the form of a comprehensive financial regulation package, much of the actual regulation remains to be implemented. Even then, it is unlikely that the financial reforms will do more than moderate the distortions. This reality suggests that policies that mitigate current account balances (in either direct) warrant consideration as second-best alternatives.

3. Empirics

In this section we estimate a simple analytical model of current account balances as well as national saving and investment. In doing so we build on the work of Chinn and Prasad (2003) and Chinn and Ito (2007) and will estimate the following two models.

Model 1:

$$y_{i,t} = \alpha + \beta_1 BB_{i,t} + \beta_2 FD_{i,t} + X_{i,t}\Gamma + u_{i,t} \qquad (1)$$

Model 2:

$$\begin{aligned} y_{i,t} = \alpha &+ \beta_1 BB_{i,t} \\ &+ \beta_2 FD_{i,t} + \beta_3 LEGAL_i + \beta_3 KAOPEN_{i,t} \\ &+ \beta_4 \left(FD_{i,t} \times LEGAL_{i,t}\right) + \beta_5 \left(LEGAL_{i,t} \times KAOPEN_{i,t}\right) + \beta_6 \left(KAOPEN_{i,t} \times FD_{i,t}\right) \\ &+ X_{i,t}\Gamma + u_{i,t} \,. \qquad (2) \end{aligned}$$

$y_{i,t}$ refers to three dependent variables: the current account balance, national saving, and investment, all expressed as a share of GDP. *BB* is the government budget balance, *FD* is a measure of financial development, for which private credit creation (PCGDP) is usually used; *KAOPEN*, the Chinn-Ito (2006) measure of financial openness; and *LEGAL* a measure of legal/institutional development – the first principal component of law and order (LAO), bureaucratic quality (BQ), and anti-corruption measures (*CORRUPT*).[11] $\boldsymbol{X}_{i,t}$ is a vector of macroeconomic and policy control variables that include familiar determinants current account balances such as net foreign assets as a ratio to GDP; relative income (to the U.S.); its quadratic term; relative dependency ratios on young and old population; terms of trade volatility; output growth rates; trade openness (= exports+imports/GDP); dummies for oil exporting countries; and time fixed effects.

Panels of non-overlapping 5-year averages are used for all explanatory variables except when noted otherwise. All the variables, except for net foreign assets to GDP, are converted into the deviations from their GDP-weighted world mean prior to the calculation of five year averages – net foreign asset ratios are sampled from the first year of each five-year panel as the initial conditions.[12] The data are mostly extracted from publicly available datasets such as the *World Development Indicators*, *International Financial Statistics*, and *World Economic Outlook* (for details see the appendix).

[11] *LAO*, *BQ*, and *CORRUPT* are extracted from the ICRG database. Higher values of these variables indicate better conditions.

[12] The variables for ToT volatility (*TOT*), trade openness (*OPN*), and legal development (*LEGAL*) are averaged for each country, i.e., they are time-invariant.

The original annual data include 23 industrial and 86 developing countries covering the four decades 1970-2008.[13] We regress current account balances, national saving, and investment on the same set of regressors separately for industrialized countries (IDC), developing countries (LDC) and emerging market economies (EMG).[14]

3.1 Baseline Results

Table 1 shows the results for Model 1. Note first that these are consistent with the twin deficits hypothesis: budget surpluses and current account surpluses move together, other things equal. A coefficient of less than one suggests however that they move together less than proportionately.[15] Larger net foreign assets, which should generate a stronger income account, affect the current account balance positively, as anticipated. The relative income terms, which tend to be jointly if not always individuallly significant, show that higher income countries generally have stronger current accounts ("capital tends to flow from higher to lower income countries"). Countries with higher dependency ratios (and, by the life-cycle hypothesis, lower savings rates) generally have weaker current accounts.[16] Oil exporting countries have stronger current accounts, other things equal. All this is as expected.

The Caballero-Farhi-Gourinchas (2008) hypothesis that countries with more developed financial markets should have weaker currents accounts ("capital flows from China, with its underdeveloped capital markets, to the United States, which has a comparative advantage in producing safe financial assets") finds weak support in the full sample (left-most column).[17] The pattern is the same but the significance of the effect vanishes when we disaggregate industrial and developing countries. This is perhaps not surprising, in that the hypothesis in question emphasizes flows between industrial and developing countries, not among members of the two subgroups.

[13] The five year panels are 1971-75, 1976-1980, etc. However, the last panel is composed of only three years: 2006-08. We can consider the last panel as the years of the global imbalances.
[14] The emerging market economies are defined as the economies classified as either emerging or frontier during 1980–1997 by the International Financial Corporation, plus Hong Kong and Singapore.
[15] These estimates are very similar to those in Abbas et al. (2010), who find that the elasticity of the current account balance with respect to the fiscal balance is on the order of 0.2-0.3. Erceg et al. (2005) also show their simulation results yield the coefficient of the budget balance to be around 0.20.
[16] Although this result does not show up for the industrial countries.
[17] The *p*-value is 15%.

Two dummy variables for the 2001-5 and 2006-8 subperiods look to the question of whether recent experience has been unusual.[18] Emerging market economies appear to have run unusually large surpluses in the first subperiod, consistent with the idea that they were fixated on minimizing financing vulnerabilities and accumulating reserves following the Asian crisis. Such behavior is not evident for emerging markets as a group in 2006-8, when the contribution of emerging markets to global imbalances was increasingly a China story.[19] A surprise is that we see the industrial countries as a group running larger surpluses in the same 2001-5 period than their other characteristics would lead one to expect. Evidently the United States was an outlier in this respect.[20]

Table 2-1 add the institutional variables. The principal result of interest is the coefficient on the interaction between capital account openness and financial development (together with the financial-development effect discussed above). For the full sample and the IDC and EMG subsamples, the results are again supportive of the Caballero et al. interpretation of global imbalances with statistically significant coefficients. Among emerging markets, those with better developed financial markets and open capital accounts similarly have weaker current account balances, as if they are on the receiving end of inflows (or experience the least tendency for capital to flow out). Also, consistently with the saving glut hypothesis, further financial deepening coupled with higher levels of legal development would worsen current account balances. When we look only at the industrial countries, however, these patterns are no longer evident.

Table 2-2 then estimates the model for savings and investment separately. A few results of note are that government budget deficits affect primarily national saving (in the same direction as government saving, contrary to Ricardian equivalence stories), that dependency ratios affect both savings and investment (as emphasized in Eichengreen and Fifer 2002).[21] As the saving glut

[18] Time fixed effects for all the five-year periods (except for the first five-year period) are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table.

[19] We can confirm this by adding a dummy variable for China in the post-2005 period. Its coefficient is positive and significant at the one per cent level, while the coefficient for emerging markets as a group in this subperiod continues to be zero.

[20] We can confirm this by adding a dummy variable for the U.S. in the 2001-5 subperiod; its coefficient is negative, and adding it does not eliminates the significant positive coefficient for 2001-5 in the industrial-country column. Not surprisingly, when we include all countries (in the left-most column), these period dummy variables are insignificant, since by definition current accounts should sum to zero.

[21] The Ricardian hypothesis predicts that any change in public saving would be offset by the exact same change but with the opposite sign in private saving, thus making the estimated coefficient of budget balances zero. The

proponents argue, further financial development would lessen the need for precautionary saving. If a country is equipped with better-developed legal systems, the negative impact of financial development on national saving can be even larger. Financial development has a more consistent impact on investment than saving (something that would not be obvious a priori). A number of other variables that do not appear to have a significant impact on the current account balance in Table 1 or Table 2-1, such as growth, trade openness and terms-of-trade volatility, nonetheless affect both savings and investment significantly; they just affect them in the same direction.

3.2 Further Investigation on the Analysis on Current Account Balances – Contributions of the Determinants

To examine what may have contributed to the global imbalances, we need to have a more in-depth analysis on how the determinants of current accounts contributed to the rise and fall of the balances. As we discussed in Section 2, there are competing, but not mutually exclusive, hypotheses that identify important factors to current account balances. The estimation from the previous section allows us to observe how the contributions of the explanatory variables have evolved over time.

Figure 3 illustrates, for several selected countries, the actual contributions of the factors of our interest (i.e., $\hat{\beta}_i x_i$) to current account balances using the estimates from the regression analysis we reported in Table 2.[22] While we have a large number of explanatory variables, we want to focus on several variables to compare the competing hypotheses. Therefore, we group some of the contributions of the variables of our interest. More specifically, we group the estimated contributions of financial development, legal development, financial openness, and their three interactions into one group, and call it the contribution of the "saving glut" group of variables. We also group the contributions of young and old dependencies into the "demography" group. Besides these two groups, we show the estimated contributions of budget balances and net foreign assets. The other factors are lumped into the "Others" group. The figures in the left column illustrate the contributions of factors to the levels of current account balances. Those in the right column on the other hand illustrate the contributions to the changes

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Ricardian framework can be extended to predict public dissaving would not crowd out private investment, thus making public saving and investment uncorrelated.

[22] The contributions are calculated using the estimation results for the subgroup of countries the concerned country belongs to.

in the current account balances of the changes in the factors, or the groups thereof, of our interest. By construction, the sum of all the four bars should add up to the predicted values, or changes in the predicted values (the dotted line with the square nodes). Comparing these bars with the actual current account balances, or changes in current account balances (the solid line with the diamond nodes), should give us some inferences about what factors have contributed to the current account balances or their changes and allow us to compare the different hypotheses we discussed in the previous section.

We can make several observations from the graphs. First, while the contributions of budget balances and net foreign assets have varied over time, those of the "saving glut variables" and "demography" tend to be stable. Second, the contribution of the demographical factors tends to be large for industrialized countries, but that is not the case for emerging market economies. Third, for the United States and the United Kingdom, although the level of budget balances does not seem to be a big contributor, the changes in the balance appear to be more correlated with the changes in the current account balances, suggesting that changes in budget balances contribute to guiding the direction of current account balances. Fourth, the group of the "saving glut variables" has been contributing to improving current accounts for emerging market countries, but its effect has been relatively stable, not just a recent phenomenon.

These observations are confirmed in Table 3 which show the beta coefficients for the estimation originally shown in Table 2-1. The estimates in this table should be interpreted as showing by how many standard deviations the dependent variable, i.e., current account balances (as % of GDP), should move if one of the explanatory variable moves by one standard deviation *ceteris paribus*. The beta coefficients are often used as measures to show the level of relative importance among the explanatory variables. According to Table 3, budget balances, net foreign asset, and old dependency ratios affect the variation of current account balances for the sample countries. The saving glut variables are found to have more influence on the variation of current account balances for the industrial countries, but not necessarily in line with the prediction of the saving glut hypothesis. While the levels of legal development or financial openness is an important determinant for the less developing countries, the interactions between financial and legal development or between financial development and openness are important for emerging market countries in a way consistent with the saving glut hypothesis. However, the magnitude of contribution is not great.

3.3 Other Potential Determinants of the Current Accounts?

3.3.1 Financial Booms and 'Leveraging' as Contributors to Current Account Balances

While we had an extensive set of explanatory variables to investigate the determinants of the current account balances, our estimation model may not have exhausted a list of candidate determinants, especially in terms of explaining the peculiar period of global imbalances. As we have discussed already, one potential contributor to the peculiarity is the booming financial markets in the 2000s. In the period prior to the financial crisis of 2008-09, households in many advanced economies, most notably the United States, borrowed money robustly, fueling domestic absorption. While we can count a number of factors such as low interest rates, lax standards for bank lending, a global-scale expansion of exotic mortgage products and securitized loans as the determinants of strong growth in household borrowing and consumption, many of these factors are difficult to measure in a way that can be incorporated into a cross-country empirical analysis.

Nonetheless, we can investigate whether and to what extent financial exuberance may have had an impact on the current account by incorporating the level of 'leverage' by households into our analysis. Here, we define leverage as the ratio of debt to household disposable income. Using the OECD database, we have *HH-Leverage 1*, which is the growth rate of the ratio of household debt ('general loans') to disposable income as the general measure for the growth in household leverage. We also have *HH-Leverage 2*, that is the growth rate of the ratio of household mortgage debt to disposable income. As a comparison, we also construct *G-Leverage*, that is the growth rate of the ratio of government debt to government revenue as the measure of government leverage. While *G-Leverage* is available for most of OECD countries since the early 1970s, *HH-Leverage 1* and *HH-Leverage 2* are quite limited, available for a smaller number of OECD countries only after 1995.[23]

Figure 4 illustrates the development of the growth rates of these leverage measures.[24] In panels (a) through (c), we can see that countries did experience high growth in leveraging in the years leading up to the crisis of 2008-09. The growth rates are especially higher when we

[23] *G-Leverage*, *HH-Leverage 1*, and *HH-Leverage 2* are available for the maximal of 30, 27, and 16 countries, respectively, though the availabilities are mostly concentrated in recent years.

[24] In the OECD database, the level of household disposable income is not available, but the annual growth rate is available. Hence, we calculate the growth rate of household leverage measures as the growth rate of household debt, either general or home mortgage, minus the growth rate of household disposable income.

measure the level of leveraging using the mortgage loan debt as we discuss anecdotally. We cannot discern any regularity in government's leveraging. However, it seems that the level of leveraging declined in several years leading to the crisis period.

We now include these variables in our estimation and report the results in Table 4. We must note that the data availability of the leverage measures restrict our sample. The estimations are now run only for the OECD countries, and those with either *HH-Leverage 1* or *HH-Leverage 2* cover data from 1996 on, i.e., the last three five-year panels, 1996-2000, 2001-05, and 2006-08. The estimations with *G-Leverage* include more panels (starting in 1971), but the sample is limited in earlier panels.[25]

Table 4 shows that higher growth in the level of general household leverage leads to worsening of the current account as we expect. A one percentage point increase in the growth rate of household leveraging leads to a 0.25 percentage point *decrease* in the current account balance. However, when we measure household leverage focusing on home mortgage, we do not see any significant negative impact on the current account. In column (3), we also see that the government's taking more leverage can lead to worsening current account balances, again consistent with theoretical prediction. When we include both *HH-Leverage 1* and *G-Leverage*, however, the impact of *G-Leverage* now becomes positive. Given that the coefficient of *HH-Leverage 1* remains negative with even greater magnitude and statistical significance, and also that the simple correlation between *HH-Leverage 1* and *G-Leverage* is found to be quite low, the positive coefficient of *G-Leverage* should not be driven by multicollinearity. We interpret the result as being driven by greater government debt accumulation in the slowdown.[26]

Given the extent of global imbalances and financial boom experienced in the 2006-08 period, we also seek to identify any evidence for a heightened effect of leveraging. To that end, we include interaction terms between the fixed effect for the 2006-08 period and the leverage variables and report the right half of Table 4. In the model that includes both *HH-Leverage 1* and *G-Leverage* and their interactions with the 2006-08 period dummy, we see evidence that the growth in household leveraging has a particularly higher impact on the current account in 2006-08. There seems to be an additional impact of household leveraging in terms of mortgages in the

[25] Since Japan appears to be an outlier for its high growth in public leverage (*G-Leverage*), we remove the country's effect by interacting *G-Leverage* with a dummy for Japan. But we do not report the estimate in the table, which is often found to be significantly positive.

[26] When we use the government leverage variable calculated using the data on government debt and revenue from IMF's WEO, the results are unchanged although the number of observations increases significantly.

2006-08 period, but it is not statistically significant. We also see the impact of government leveraging is particularly high in the 2006-08 period as well.

3.3.2 Foreign Reserves Accumulation?

Another variable one may be interested in as a contributor to current account balances is international reserves holding. Most of large international reserve holders run current account surpluses constantly as we see among East Asian countries and oil exporting countries. As we have seen previously, the Bretton Woods II argument by Dooley et al. focuses on the link between international reserves holding and continuous current account surpluses. However, it is difficult to examine the impact of international reserve holding on current account balances because the current account balance and contemporaneous reserves are simultaneously determined – positive shocks to the current account will translate into positive shocks to reserves.

Hence, we include in our estimation foreign reserves as a percent of GDP, lagged one five-year period, as an additional explanatory variable[27] [28] Our presumption is that, other things equal, larger reserves from the previous period – that can also represent the past tendency of international reserves holding – should mean less incentive for reserve accumulation and a weaker current account. For the industrial countries, the coefficient on this variable is negative and significant, as hypothesized. For emerging market economies, it is insignificant. For developing countries, it is positive and significant, contrary to the hypothesis.[29]

3.3.3 Is It an East Asian or U.S. Phenomenon? Or Both?

As was in the case of international reserves, some of the competing hypotheses for the global imbalances unsurprisingly focuses on socio-economic, institutional, or geographical characteristics of the countries that have run persistent current account imbalances such as East Asian countries and the United States. Capital flows can be affected by some externality in geographical regions as well as political or geopolitical roles of the countries, but these factors may be not fully represented by the explanatory variables.

In fact, if we include the dummies for the United State, China, or other East Asian emerging market countries in our basic estimation model using the full sample, these dummies

[27] Results not shown in the table.
[28] Gagnon (2011) argues that the change in the foreign exchange reserves should be included.
[29] These estimates are based on model 2 including the institutional variables.

turn out to be significant.[30] The dummy for the United States is found to be -3.5% whereas the ones for China and ex-China East Asian emerging countries are +3.3% and +2.4%, respectively (not reported). These results suggest that there can be unobservable factors contributing to the determination of current account balances.

We then ask whether the country- or country-group- specific factors are stable over time by allowing the dummies for the U.S. and East Asian emerging markets to vary over 5-year panels. Figure 5 shows the estimates of the interaction terms between the dummies for the U.S., China, and ex-China East Asian emerging countries and fixed effects for the five-year panels in the full sample estimation. In the figure, we report insignificant estimates as zeros.[31] We can see that the "U.S. effect" is relatively stable, though ranging between -2.0 to over -6.0%. This is consistent with the view that the U.S. has some special characteristic allowing it to run persistent current account deficits of some 3 per cent of GDP on average, presumably as a result of its status as the issuer of the international vehicle currency.[32]

The "ex-China East Asian" or "China" effect is, on the other hand, not stable over time the effect for the East Asian emerging market countries is evident only after the Asian crisis of 1997-98, reflecting the investment drought in the post-crisis period (Chinn and Ito, 2007). Considering that "excess" current surplus is more of a recent phenomena despite the long-time focus on export-led industrial policy, it is difficult to argue that the main cause for these countries' persistent current account surplus is due to their mercantilism motives.

The same argument applies to China. While there are some time periods when China's current account balances are higher than model predictions, it is noteworthy that its current account surplus is especially high in the global imbalances period, marking the level of excess surplus as high as 7% of GDP.

4. Are the Current Account Balances Atypical in the 2006-08 Period?

The observations from the last section suggests the possibility that current accounts may have behaved atypically in the 2006-08 period, which is the global imbalances period prior to the global crisis. Figure 6 displays the implied current account balances for several countries along with 95% confidence intervals of prediction that are calculated using the estimation results

[30] "East Asian emerging market countries" include China, Indonesia, Korea, Malaysia, and Thailand.
[31] We use the estimation model with institutional variables (Model 2).
[32] See Gourinchas and Rey (2007).

shown in Table 2.[33] The figure shows that the U.S. current account deviated from the predicted path significantly in the 1996-2000 and 2001-05 periods though it falls back in the 95% confidence interval in the last period. Germany's and China's current accounts are well outside the confidence interval. These results suggest the possibility of missing variables that are not captured by the estimation model as far as the last period is concerned.

Let us take a look at the distribution of the prediction errors from the estimation model to see how well the estimation model explains the variations of current account balances in different time periods. In Figure 7, the Kernel density estimates of the distribution of the prediction errors from Model 2 (Table 2-1) are presented for different sample groups and different time periods. Interestingly, for the full sample and the LDC and EMG subsamples, the distribution of the prediction errors from the baseline estimation has become significantly wider in the 2006-08 period.[34] For the group of industrialized countries, the prediction errors are more skewed to the left and more widely distributed widely distributed in 2006-08, but wide variation of the prediction errors appears also in the 1980s and the 1990s besides the last period.

In sum, our estimation model does not seem to predict well the current account series in the 2006-08 period for developing countries, especially those with emerging markets, and to a lesser extent the same conclusion can be made for the group of industrial countries, suggesting a possibility of a regime shift in the current account balance series in this period.

4.1 Identifying Structural Breaks

With a suspicion of a structural break in the current account behavior in the period immediately before the global crisis, we conduct further analysis to confirm the structural break. Here, we make out-of-sample predictions retroactively and recursively and estimate the probabilities of actual current account balances compared to the distributions of predicted levels of current account so as to examine whether the realized current account balances were "surprises" or not. More specifically, we first make the forecasts of current account balances for the 2006-08 period using data through 2005. We then calculate the confidence intervals of the

[33] We continue to use Model 2 (Table 2-1) that includes institutional variables and their interactions.
[34] The unstable distribution of prediction errors is consistent with our use of heteroskedastic-consistent standard errors.

(retroactive) forecasts, which we call the "pseudo-confidence intervals of forecast".[35] With the pseudo-confidence intervals of forecast, we can estimate the probability of an actual, or realized, value of current accounts by calculating how many standard deviations the realized value of current accounts is away from the "forecasted" value. The number of standard deviations corresponds to the *t*-statistics (adjusted for the degrees of freedom), and gives us the *p*-value of the realized current account balancing occurring.

Figure 8 shows the "forecasting" exercise for the 2006-08 period for Germany. The realized current account balance for the country is very close to the upper limit of the 90% pseudo-confidence interval. Hence, we can suspect that, based on the estimation that uses data up to 2005, the probability of such a level of current account balance occurring is close to 5%. In fact, the *p*-value is found to be 7.6%. We repeat this exercise and retroactively forecast the current account balance for the 2001-05 period using the data up to 2000 (Panel (b) of Figure 8). We recursively and retroactively conduct the out-of-sample predictions back to the 1991-95 period and estimate the probabilities for realized current account balances.[36]

Table 5 reports the out-of-sample prediction errors and the estimated *p*-values for our samples of industrialized and emerging market countries. For example, we can see that, for the United States, the probability of the level of current account balance in the 2006-08 period is 18.4% based on the estimation with the data up to 2005 and the probability of the level of current account balance in 2001-05 is 19.4% based on the estimation with the data up to 2000. These *p*-

[35] We need to be careful about the distinction between the "confidence intervals of predictions" and the "confidence intervals of forecasts." The former is literally the confidence intervals of predicted values, or the conditional mean of y (i.e., $\hat{y}$) given a set of regressors x_i's. The confidence interval of predictions reflects the uncertainty of the estimated coefficients (captured by the confidence intervals of $\hat{b}$ in $X'\hat{b}$). The "confidence intervals of forecasts" are the confidence intervals for the unknown values of y for a known set of x_i's. Hence, this type of confidence intervals reflect not only the uncertainty of the estimated coefficients, but also the distribution of prediction errors. In other words, the "confidence intervals of forecasts" are constructed by using the $\text{var}(y_i) = \text{var}(\hat{y}_i) + \text{var}(\varepsilon_i)$, which is the sum of the variance of predictions and that of the errors. For the variance of the errors, the standard errors of regressions (SER) are normally used in the estimation that assumes homoskedasticity. In our estimation, however, we allow for heteroskedasticity, and thereby cannot use the SER. Hence, we instead use the standard deviations of the prediction errors from the last five-year period before the forecasted period. Because we make forecasts retroactively for the past periods and because we make modifications for the variance of the prediction errors (instead of using SER), we call our confidence intervals of forecast the "pseudo-confidence intervals of forecast."

[36] One could argue that as the out-of-sample predictions proceed to earlier periods, the degree of freedoms would decline, so could the accuracy of the predictions. However, the pseudo-confidence intervals should reflect the decline in the accuracy of the predictions with greater standard deviations of prediction errors prior to the forecasted period and thereby with wider pseudo-confidence intervals. Hence, the *p*-values are still comparable across different time periods.

values can be interpreted as the measure that represents the extent of "surprise." The smaller the *p*-value is, to the higher extent the realized current account balance is perceived as a surprise.[37] In the table, the *p*-values in bold indicate the *p*-values below 5%. The lowest *p*-values across different time periods should indicate the "most surprising" current account balances. If most countries experience the "most surprising" current accounts in one period, that period can be interpreted as a structural break.

The tables show that the average probabilities are the lowest in 1996-2000 for IDC and 2006-08 for EMG. That is, on average, the level of current account balances was most surprising in 1996-2000 for IDC and in 2006-08 for EMG. Also, the number of countries with the *p*-value below 5% ("surprises") is the highest in 1996-2000 for IDC (six countries) and 2006-08 for EMG (10). Furthermore, nine industrial countries which have the lowest *p*-values ("most surprising") in 2006-08 while 21 EMGs also have the lowest *p*-values in the same period. Given the lowest subsample average of the *p*-values, and that a large number of countries have the surprising level of *p*-values, we can conclude that emerging market countries have experienced a structural break in 2000-06. For the industrialized countries, there are more indications that the structural break may have occurred in the 1996-2000 period, but given the low level of *p*-values, the 2006-08 period may not be ruled out as a structural break point.

4.2 What Happened in 2006-08?

We focus on the 2006-08 period since we found it to be the structural break point strongly for emerging market countries and to a lesser degree for industrialized countries. Given the debates on the link between the global imbalances and the global crisis, it is reasonable to focus on this time period.

The results from the previous subsection indicate that there may be some factors that are not captured by the estimation model, and which may have helped current account balances in the period turned out to be significantly different from what could have been predicted. Table 5 and Figure 9 show that the out-of-sample prediction errors for this period (using the data up to 2005) vary widely across countries. We will further investigate what factors contributed to the unexplainable component of the current account balances of our sample countries.

[37] Because the prediction must either over- or under-predict the actual current account balance, the highest probability is 50%.

We can think of several candidate factors that may have contributed to the unexplainable component of current account balances. Before the global crisis, financial markets were experiencing the "irrational exuberance." While we include *PCGDP* in the estimation, this variable may not capture the robustness of the financial markets, but it would rather merely proxy for the extent of financial development. Some variables that represent exuberant financial markets may explain the unexplainable component of current accounts.

The recent pile-up of international reserves by emerging market countries has to led many researchers to examine the determinants and the effects of international reserves holding. Some researchers focus on the mercantilist motive for holding international reserves (such as Aizenman and Marion, 2007). It is worthwhile of examining whether and to what extent international reserves holding affects the unexplainable part of current account balances in the period.

Monetary policy may have contributed to the imbalances of current accounts through stimulating absorption. Some researchers (such as Taylor, 2009) argue that the Fed maintained lax monetary policy for too long, thereby keeping the cost of capital too low and feeding speculative investment in real assets. By the same token, fiscal policy should be suspected as one of the contributors. However, since budget balances are already included in the original estimation model, we suspect whether the extent of procyclicality matters for current account balances.

Although Chinn and Wei (2009) show that the exchange rate regime does not affect the current account adjustment, it has been anecdotally argued that the type of the exchange rate regime affects the behavior of current accounts.

Lastly, we also investigate whether the performance of housing markets affects the current account balances. One may need to be careful about this factor since it is probably the least exogenous factor among the ones we have talked about. To much extent, the performance of housing markets is the outcome of monetary policy, financial regulations, and other macroeconomic and institutional factors. In fact, we have already investigated the impact of leveraging on current account balances in a previous subsection. However, although we do find that general household leveraging leads to worsening current account balances, we do not find any evidence for mortgage leveraging affecting current account balances. It is possible that rising housing prices may have caused wealth effect and consequently contributed to increasing

domestic absorption. As many researchers have focused on the impact of the housing markets on current account balances (such as Aizenman and Jinjarak, 2009 and Fratzscher and Straub, 2009), asset market booms can attract capital inflows, thus worsening current account balances, through increasing perceived levels of wealth.

Figure 10 illustrates scatter plots for the prediction errors and several variables of our interest, focusing the financial booming period. It appears that both real appreciation rate of housing prices and the growth rate of private bond market capitalization in the pre-crisis period of 2002-06 are negatively correlated with the prediction errors of current account balances. However, we cannot discern any (unconditional) correlations for stock market total values or public bond market capitalization.

We surely need to control for other conditions. Hence, we run the following estimation equation:

$$\hat{u}_{it} = \varphi W_{it} + \theta D_i + \varepsilon_t \ . \qquad (3)$$

$\hat{u}_{it}$ is the out-of-sample prediction errors from the estimation for the 2006-08 period with Model 2 for different subsamples. W_{it} is a vector of candidate variables that may explain the unexplainable component of current account balances. More specifically, it includes the following variables:

- Average change in stock market total value (*SMTV*) in 2002-06;[38]
- Average change in public bond market capitalization (*PBBM*) and private bond market capitalization (*PBBM*) in 2002-06;
- Fiscal procyclicality – the correlations between Hodrick-Prescott (HP)-detrended government spending series and HP-detrended real GDP series in 2006-08 (*FIS_PRO*);
- Dummy for the fixed exchange rate regime (FIX) in 2006-08 – assigned the value of 1 if a country is categorized as the fixed exchange regime in the Rogoff-Reinhart exchange rate regime index (2008), zero, otherwise;[39]

[38] While the stock market capitalization variable (*SMKC*) represents the level of stock market development in terms of the size (or depth), *SMTV* or stock market turnovers (*SMTO*) can be a measure of the activeness of stock markets. Both *SMKC* and *SMTO* are found to be consistently insignificant, and therefore, dropped from the estimation.

[39] The most frequent type of the exchange rate regime is chosen for the 2006-08 period. The type of the exchange rate regime is based on the "coarse version" of the Rogoff-Reinhart exchange rate regime index.

- International reserves as a ratio to GDP (*IR*) as of 2005;
- Real interest rate (*Real_Int*) – Lending rate minus the rate of inflation based on GDP deflators as of 2005;
- Average of the real housing appreciation (the growth rates of housing indexes adjusted for CPI-inflation) in 2002-06. [40]

D_i is also included in the estimation to examine whether there are any country-specific effects for the countries that have experienced notable current account imbalances. We run the estimation as specified in equation (3) and report the results in Table 6. Since the number of observations is small – both private/public bond market capitalization variables and the housing price indexes are quite restrictive especially for non-industrial countries, we lump both industrialized and emerging market countries into one sample. Despite the small number of observations that makes us a little cautious about interpretation, we have some interesting results.

As one can expect, the performance of stock markets tends to worsen current account balances in the global imbalances period, though the level of statistical significance can differ across different models. Private and bond market performances do also seem to affect current account balances in this period. In sum, better performance in the financial markets appear to have contributed to more capital inflows, thus worsening current account balances in the global imbalances period. Unfortunately, the small sample size does not allow us to identify what type of financial market performance most affects the unusual performance of current account balances in this period. But given that the variable for the growth in stock market total values is more significant in the models that include the country dummies (with significant coefficients), we may conclude that stock market performance affects the unusual current account balances in the pre-crisis period. While fiscal procyclicality does not seem to affect the unexplainable component of current account balances, there is some evidence that monetary policy matters for current account balances. In the models that include the housing index, the real interest rates as of 2005 are found to be a negative contributor to the unexplainable part of current account balances despite the significant entry of the real housing appreciation variable. As was shown in

[40] We collected housing indexes for as many countries as possible, using the CEIC database, government statistical agencies, and other private organizations that keep track on housing prices. For several countries, we use the data provided by Joshua Aizenman and Yothin Jinjarak. The original data are available for 47 countries. While data availability varies widely among countries, the data for most of the countries are available after 1990. For this exercise, the average real growth rate of the housing indexes for the 2002-06 period is included. The choice of the period is driven by the facts that the last world recession occurred in 2001; the housing bubble peaked in 2006.

Figure 10, real housing appreciation does negatively affect the unexplainable component of current account balances. Consistently with Aizenman and Jinjarak, we can conclude that asset market boom tends to attract capital inflows. Despite much attention paid to the recent, rapid accumulation of international reserves, international reserves do not seem to contribute to the unexplainable component of current account balances. [41]

Despite all these explanatory variables, there is still an unexplainable component of current accounts for several countries with large current account imbalances, namely, the United States, China, Greece, and Iceland. This result may indicate that these countries need to implement policies that are particularly tailored for their country-specific situations that affect the saving and investment decisions.

5. Forecasting Current Account Balances

5.1 Forecasts of Current Account Balances for 2012-16

Let us turn our attention to the future. We now use these estimated relationships to forecast the prospects for global rebalancing. We construct forecasts of the independent variables out to the 2012-16 period and use our estimates from our baseline model to project values for the current account. The forecasts start with 2012, omitting the crisis years 2009-11, when behavior was unusual. The assumptions and the data for the out-of-sample projections are explained in Appendix 2.[42] We make two types of forecasts: one type is the forecasts we make using data through 2008 and the other is the forecasts we make using data only through 2005. Given the possibility of a structural break in 2006, the forecasts made with data through 2005 can be interpreted as the projections of the current account countries may experience if their economic conditions revert to the pre-global imbalances period. Figure 11 presents forecasts of current account balances for several countries which either contributed to the global imbalances or are experiencing debt crisis (as of the fall of 2011). The forecasts made using data up to 2008 are shown in the red line and the forecasts made using data through 2005 are shown in the grey line.

[41] We also repeat the same exercise, but in a panel context, by using the retroactive prediction errors from Table 5 as the dependent variables and having the explanatory variables of equation 3 as the five-year averages. The results from this exercise (not reported) yield consistent results with those reported in Table 6. However, it must be noted that the data availability of the housing prices as well as bond market capitalization variables restrict the size of the sample significantly, making it composed of data mostly from the 1990s and of industrialized and emerging market countries.

[42] We use model 2 (including the institutional variables) and the separate estimates for industrial and emerging-market economies as the basis for our forecasts.

One standard deviation confidence intervals of forecast are also shown, that correspond to about 65% of probability of occurrence.

For the United States, the forecasts based on the data through 2008 in Figure 11 suggest its current account deficit stabilizes around 4% of GDP though the IMF projects it will significantly improve to 2%. The forecasts with the data through 2005 suggest even a deterioration of current accounts. However, although both models have the tendency of persistently underpredicting U.S. current account deficits, both of their predicted levels of current account balances end up getting close to the IMF projection.

A similar observation can be made for the UK; in either U.S. or U.K. case, the narrowing of current account deficits over the period is more limited than the IMF projection. The news for the surplus industrial countries, namely Japan and Germany, is even less reassuring. The forecasts suggest that their surpluses will remain stable or even rise further, absent additional policy changes. However, again, the IMF projects there will be more rebalancing for these countries.[43] Our model predict the European debt crisis countries will continue to run current account deficit, but the current debt crisis will probably cause these countries to experience rebalancing because of weakened demand by the crisis. Our results on leveraging may also fill the gap between the IMF projection and our prediction which does not incorporate leveraging/deleveraging effect. As we have been observing, the Euro crisis has led European countries to decrease their financial exposure; deleveraging is taking place on a large scale. If that is the case, current account deficit countries should experience an improvement in their current account balances as we found previously. Our results suggest that one percentage *decrease* in the growth rate of household leverage should lead to a 0.2 percentage point improvement in current account balances as the share of GDP.

Among emerging market countries with current account surpluses, our model predicts their surpluses slightly rise or remain constant. If the "East Asian effect" we observed in Figure 5 continues to exist, the relatively stable predictions of their current account surpluses would mean their surpluses would persist. One interpretation is that the circle will be squared by other countries that will run smaller surpluses and offset America's smaller deficits. That can be also applicable to China, but even a significant reduction in the surplus as projected by the IMF will

[43] Japan's rebalancing can be due to the earthquake/nuclear crisis in March 2011 which the IMF must incorporate in its projection.

still leave the country with a high level of surplus. A less reassuring interpretation is that the parts do not add up under current forecasts and that even partial rebalancing, possibly caused by the Euro/debt, will require further policy changes. Either way, it seems clear that imbalances will persist.

Table 7 reports the two types of forecasted current accounts for the countries for which the data are available to make forecasts, along with the 2006-08 level of current account balances and the IMF's projection for the 2012-16 period. The table shows that the IMF projects a relatively high degree of rebalancing; it projects that the average current account surplus of the countries that ran current account surplus as of 2006-08 will shrink from 7.4% (as a share of GDP) to 5.7%. The average size of current account deficit is projected to improve significantly from -7.5% to -3.4%. The variation of current account balances is also expected to drop from 10.2% to 5.4%.

Our forecasts present a somewhat different picture depending on the data to use for the forecasts. When we base our projection on data through 2008, the extent of rebalancing does not seem to be as promising as the IMF's projection. Our estimation using data up to 2008 ("Forecasts (2008)") predicts the degree of variation will drop by 3.2% (against the 4.8% drop of the IMF projection). The average size of current account surplus of the surplus countries will fall by 3.7% though we expect current account deficit improves by the same degree as the IMF projection. However, our forecasts based on data through 2005 suggest more rebalancing is on its way. The change in the extent of variation of current account balances is projected to drop by the same degree as the IMF's projection (4.6%). The average size of surplus of the surplus countries is expected to shrink much more than that of deficit of the deficit countries (-6.6% for surplus countries vs. +2.9% for deficit countries) compared to the IMF projections.

What do these results indicate? That our forecasts based on data through 2005 are closer to the IMF projection suggests that the IMF projection may be based on the assumption that countries will not revert to the economic situation that led to the unusual current account imbalances on the eve of the crisis. In other words, rebalancing of current accounts could only be achieved with the policies that would be more consistent with the economic environment of the pre-global imbalances period. However, it is also possible that the IMF projections incorporate more of what we do or cannot incorporate in our model, that is, the effect of Japan's crisis and

the deterioration of the Euro debt crisis. These further suggest that unless countries implement drastic policy changes, the global imbalances may not disappear.

5.2 What Would Fiscal Consolidation Do to the United States?

One of the big issues of macroeconomic management in coming years will be fiscal consolidation. The industrial countries have been trying to reduce budget deficits without nipping the green shoots of recovery. How will global imbalances evolve under different fiscal scenarios? Figure 12 presents different out-of-sample predictions for U.S. current account balances in the 2012-16 period depending on the different scenarios about its budget balances – the baseline scenario based on the IMF WEO's projections (see Appendix 2), an optimistic scenario, and a pessimistic scenario. The optimistic scenario is the case in which the average of the U.S. budget balances for the 2012-16 period turns out to be higher than the average based on WEO projection (-6.2% of GDP) by three percentage points.[44] The pessimistic scenario is the case in which the 2012-16 average is lower than the WEO projection by three percentage points.

Figure 12 shows that a 3 percentage point difference in the fiscal balance relative to the baseline scenario would change the current account balance by 70 basis points, i.e., about three quarters of one percentage point, suggesting that rebalancing cannot be accomplished through fiscal policy alone. If the shrinkage of budget deficits is coupled with overall economic recovery and consequent recovery in the financial markets, as in the optimistic scenario, this would in fact slightly drag down projected current account balances.[45,46]

5.3 What if China Liberalizes and Develops Its Financial Markets?

We can similarly consider alternative scenarios for financial development and capital account liberalization in China (Figure 13). The figure shows, for comparison, the same projection as in Figure 11 with the dotted grey line. It also shows the forecast if China's level of financial openness increases moderately to the level of Thailand in 2008 (blue). In this case the current account surplus falls significantly, in line with the predictions of the proponents of the

[44] Three percentage points are equivalent to 1.5 standard deviations in the distribution of U.S. budget balances in the 1969 – 2008 period.
[45] Consistent with the Caballero et al. effect.
[46] However, one factor that may improve U.S. current account balances would be the ongoing deleveraging efforts by U.S. households. Given the magnitude of the increase in the level of household leverage prior to the crisis, and given the significant impact of the financial crisis especially on the labor market, it is likely that deleveraging will contribute to improving the U.S. current account balance.

saving glut argument. The figure also shows what happens when financial liberalization proceeds to Brazilian (green) and then Mexican (orange) levels.[47] Again, this leads to further declines in the current account surplus. Thus, financial liberalization may lead to an increase in net capital inflows and thereby to a deterioration of current account balances.[48]

Figure 14 makes alternative assumptions about financial development. Recall that this is measured by the average ratio of domestic credit to GDP, which fell, relative to the world average, between 2001-5 and 2006-8.[49] A modest assumption about Chinese financial development over the next five years is that this ratio returns to its 2001-5 levels. If we place this assumption with Mexican levels of financial openness, this is enough to eliminate China's surplus. As a caution, note that the model, based on average behavior in a cross-section of emerging markets, under-predicts the Chinese surplus in recent years. That the surplus *disappears* in 2015 under this scenario is at least as much an artifact of this under-prediction as it is a consequence of the financial liberalization and development. But the point remains: how quickly China narrows its surplus will be a function in part, of how much progress it makes in financial liberalization and development. Furthermore, given that the return of PCGDP to the 2001-05 level alone (blue dotted line that almost overlaps the grey one) hardly changes the predicted current account level, and that the predicted level declines only when financial development is coupled with financial liberalization, we surmise that financial liberalization would be more effective than financial development in reducing China's current account surplus.[50] However, as we saw previously, our estimation model consistently underpredicts

[47] The countries are ranked as Mexico (69.2 in the 100 scale), Brazil (58.8), Thailand (40.3), and China (16.1) in terms of the level of finanial openness as of 2008. The average of KAOPEN for the LDC group as of 2008 is 50.2 whereras that for the EMG group is 60.9.

[48] If capital account opening occurs while exchange rates are allowed to adjust more flexibly, the current account balance could also deteriorate through the price channel. Before the policy change of increasing the flexibility of the renminbi on June 19, 2010, it had been argued that one of the reasons for Chinese hesitation to allow greater exchange rate flexibility is that policy makers in Beijing are worried that financial liberalization may lead to further capital inflows, reinforcing the upward pressure on the currency.

[49] Recall that in our empirical model all variables are normalized by the world average.

[50] This conclusion relies upon our proxy of financial development, the ratio of private credit creation to GDP, accurately representing financial development. It would be preferable to use a broader measure of financial development, such as the composite bond/equity/bank indicators used in Ito and Chinn (2009), but the data are not yet available for that exercise.

China's current account surplus. This indicates that, besides financial development and liberalization, other policies specific to China's situation will be necessary.[51]

6. Concluding Remarks

We re-examine the determinants of current account balances applying updated data to the framework based on Chinn and Ito (2007). The main purpose of this study is to examine whether the determinants of global current account balances changed during the period preceding the global crisis of 2008-09 while inquiring into the prospects for the global imbalances in the post-crisis period.

Based on our estimates, changes in the budget balance appear to be an important factor affecting current account balances for advanced current account deficit countries such as the United States and the United Kingdom. The effect of the "saving glut variables" on current account balances has been relatively stable for emerging market countries, suggesting the prominence of those factors is not a particularly recent phenomenon. We also find the 2006-08 period to be the structural break for emerging market countries, and to a lesser extent, for industrialized countries. The standard model's prediction errors are correlated with household leverage, measured as debt to personal income. Hence, the pre-crisis imbalances do appear to be related to developments in the financial markets.

When we investigate what can explain the anomalous behavior in the current account balances during the 2006-08 period, we find that stock market performance and real housing appreciation explain the unusual behavior in the pre-crisis period; fiscal procyclicality and monetary policy stance do not seem to matter as much. However, we also identify components of current account balances that can be only explained by country-specific factors. Extrapolating to the future, we find that for the U.S., fiscal consolidation alone cannot induce significant current account deficit reduction. For China, financial development may help shrink its current account surplus, but only when it is coupled with financial liberalization. These findings suggest that unless countries implement substantial policy changes, the global imbalances are unlikely to disappear.

[51] For example, how and by how much the government implements a rule that requires state-owned enterprises to pay dividends to the government can be an important policy to help reduce the enormous corporate sector saving in the country (See Ma and Wang, 2010 and Kuijs, 2006, Chinn and Ito, 2011).

Appendix 1: Data Appendix

We provide below a listing of the mnemonics for the variables used in the analysis, descriptions of these variables and the source(s) from which the primary data for constructing these variables were taken.

Mnemonic	*Source**	*Variable description*
CAGDP	WDI, WEO	Current account to GDP ratio
NSGDP	WDI, WEO	National saving to GDP ratio
KFGDP	WDI, WEO	Capital formation to GDP ratio
GOVBGDP	WDI, IFS, WEO	General government budget balance, ratio to GDP
NFAGDP	LM	Stock of net foreign assets, ratio to GDP
RELY	PWT	Relative per capita income, adjusted by PPP exchange rates, Measured relative to the U.S., range (0 to 1)
RELDEPYWDI		Youth dependency ratio (relative to mean across all countries), Population under 15 / Population between 15 and 65
RELDEPO	WDI	Old dependency ratio (relative to mean across all countries), Population over 65 / Population between 15 and 65
YGRAVG	WDI	Average real GDP growth
TOT	WDI	Terms of trade
OPEN	WDI	Openness indicator: ratio of exports plus imports of goods and nonfactor services to GDP
PCGDP	WBFS	Banking development, ratio of private credit to GDP
SMTV	WBFS	Equity market development, stock market total value as a ratio to GDP
SMTO	WBFS	Equity market development, stock market turnover
PVBM	WBFS	Private bond market capitalization as a ratio to GDP
PBBM	WBFS	Public bond market capitalization as a ratio to GDP
KAOPEN	CI	Capital account openness
BQ	ICRG	Quality of Bureaucracy
LAO	ICRG	Law and order
CORRUPT	ICRG	Corruption index

LEGAL	authors' calculations	General level of legal development, first principal component of BQ, LAO, and CORRUPT.
FIS_PRO	authors' calculations	Correlations between HP-detrended government spending series and HP-detrended real GDP series;
FIX	RR	Dummy for the fixed exchange rate regime: assigned the value of 1 if a country is assigned the value of 1 in a year in the "coarse version" of the Rogoff-Reinhart exchange rate regime indexes (2004, updated in 2009); otherwise, zero;[52]
IR	WDI	International reserves as a ratio (excluding gold) to GDP
REAL_INT	WDI	Real interest rate: Lending rate minus the rate of inflation based on GDP deflators, obtained from WDI
HOUSEP	CEIC, others	Real housing price index: housing price index deflated by CPI

* These are mnemonics for the sources used to construct the corresponding. CI: Chinn and Ito (2006); DPI2004: ICRG: *International Country Risk Guide*; IFS: IMF's *International Financial Statistics*; LM: Lane and Milesi-Ferretti (2006); OECD: *OECD Economic Outlook* Database; PWT: *Penn World Table* 6.4; RR: Reinhart and Rogoff (2004, updated); WBFS: World Bank Financial Structure Database; WDI: *World Development Indicators*; and WEO: *World Economic Outlook*.

[52] The most frequent type of the exchange rate regime is chosen for the 2005-08 period.

Appendix 2: Assumptions of Out-of-sample Forecasting Exercise

Variables	Assumptions
Government budget balance	World Economic Outlook projections (WEO, September 2011) are used.
Net foreign assets (initial)	The level of net foreign assets is assumed to remain the same as of 2004 (the last year used for the estimation).
Relative income	The relative income series (originally based on Penn World Tables) is extrapolated using the growth rates calculated based on the WEO's series of per capita income in international PPP.
Youth and Old dependency ratios	Forecasts from the UN World Population Prospects Database are used.
Financial Develop. (PCGDP)	This is a difficult variable to project. The global crisis must surely have made private credit creation smaller for many countries, but this may not be the case for some (e.g., China). Also, GDP, the denominator for this variable, shrunk for many countries, which can make the variable PCGDP relatively stable even for countries whose private credit also shrunk. We use the average of the variable (though as deviations from the world weighted averages) during the 2001-08 period. For China we consider a range of alternative assumptions.
Legal development (LEGAL)	We assume no change.
Financial openness (KAOPEN)	For the U.S., U.K., Germany, Japan, and Rep. of Korea, we assume that the level of KAOPEN as of 2012-16 to remain the same as in 2008. For China, we consider a range of alternative assumptions.
TOT volatility	We assume no change.
Average GDP growth	We use the data from the World Economic Outlook, September 2011.
Trade openness	We assume no change
Dummy for 2012-16	Since we have no estimated coefficient on the dummy for the 2012-16 period, we use the average of the time fixed-effects for the other previous panels.

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Table 1: Current Account Regression WITHOUT Institutional Variables

	Current Account			
	(1) Full	(2) Industrial Countries (IDC)	(3) Less Developed (LDC)	(4) EMG
Government budget balance	0.283	0.414	0.28	0.121
	[0.064]***	[0.086]***	[0.068]***	[0.065]*
Net foreign assets (initial)	0.039	0.089	0.029	0.023
	[0.005]***	[0.014]***	[0.006]***	[0.013]*
Relative income	0.058	0.023	0.097	0.226
	[0.015]***	[0.017]	[0.020]***	[0.090]**
Relative income squared	0.073	-0.104	0.072	0.141
	[0.019]***	[0.082]	[0.018]***	[0.079]*
Dependency ratio (young)	-0.045	0.012	-0.034	-0.02
	[0.015]***	[0.023]	[0.017]**	[0.018]
Dependency ratio (old)	-0.026	0.013	-0.025	-0.055
	[0.009]***	[0.017]	[0.011]**	[0.019]***
Financial Develop. (PCGDP)	-0.016	-0.025	0.012	-0.008
	[0.011]	[0.016]	[0.013]	[0.016]
TOT volatility	0.007	-0.1	-0.009	-0.005
	[0.020]	[0.053]*	[0.022]	[0.024]
Avg. GDP growth	-0.183	0.056	-0.207	0.033
	[0.121]	[0.173]	[0.132]	[0.121]
Trade openness	-0.001	-0.013	-0.014	-0.017
	[0.006]	[0.013]	[0.008]*	[0.010]*
Oil exporting countries	0.034	–	0.033	0.057
	[0.013]***	–	[0.013]***	[0.016]***
Dummy for 2001-05	0.014	0.023	0.017	0.039
	[0.011]	[0.010]**	[0.018]	[0.017]**
Dummy for 2006-08	0.007	0.01	0.015	0.021
	[0.013]	[0.011]	[0.020]	[0.021]
Observations	670	180	491	257
Adjusted R-squared	0.45	0.5	0.47	0.43

Note: Time fixed effects are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table.

Table 2-1: Current Account Regression with Institutional Variables

	Current Account			
	(1) Full	(2) Industrial Countries (IDC)	(3) Less Developed (LDC)	(4) EMG
Government budget balance	0.295	0.289	0.279	0.094
	[0.058]***	[0.086]***	[0.063]***	[0.054]*
Net foreign assets (initial)	0.037	0.078	0.028	0.026
	[0.006]***	[0.008]***	[0.007]***	[0.012]**
Relative income	0.09	0.018	0.135	0.284
	[0.018]***	[0.022]	[0.022]***	[0.093]***
Relative income squared	0.055	0.02	0.046	0.16
	[0.018]***	[0.094]	[0.017]***	[0.081]*
Dependency ratio (young)	-0.033	0.004	-0.029	-0.029
	[0.015]**	[0.025]	[0.017]*	[0.019]
Dependency ratio (old)	-0.019	0.057	-0.022	-0.068
	[0.010]**	[0.021]***	[0.011]**	[0.020]***
Financial Develop. (PCGDP)	-0.027	-0.02	0	-0.117
	[0.014]*	[0.010]*	[0.029]	[0.038]***
Legal development (LEGAL)	-0.008	0.015	-0.015	-0.018
	[0.005]*	[0.005]***	[0.007]**	[0.012]
PCGDP x LEGAL	-0.011	-0.014	-0.007	-0.032
	[0.008]	[0.012]	[0.008]	[0.014]**
Financial open. (KAOPEN)	0.002	0.008	-0.009	-0.008
	[0.005]	[0.004]*	[0.008]	[0.009]
KAOPEN x LEGAL	0.003	0.012	-0.001	0.004
	[0.001]***	[0.003]***	[0.002]	[0.003]
KAOPEN x PCGDP	0.002	0.028	0.003	-0.02
	[0.007]	[0.010]***	[0.008]	[0.010]*
TOT volatility	0	0.028	-0.01	0.023
	[0.023]	[0.047]	[0.024]	[0.025]
Avg. GDP growth	-0.097	0.178	-0.09	0.072
	[0.091]	[0.178]	[0.099]	[0.117]
Trade openness	-0.001	-0.001	-0.005	0
	[0.006]	[0.011]	[0.010]	[0.012]
Oil exporting countries	0.028	–	0.025	0.045
	[0.013]**	–	[0.012]**	[0.016]***
Dummy for 2001-05	0.025	0.015	0.033	0.041
	[0.009]***	[0.009]*	[0.015]**	[0.017]**
Dummy for 2006-08	0.017	0.002	0.032	0.019
	[0.011]	[0.010]	[0.018]*	[0.022]
Observations	621	174	447	250
Adjusted R-squared	0.5	0.63	0.52	0.46

Note: Time fixed effects are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table.

Table 2-2: National Saving and Investment Regression with Institutional Variables

	National Saving				Investment			
	(5) Full	(6) Industrial Countries (IDC)	(7) Less Developed (LDC)	(8) EMG	(9) Full	(10) Industrial Countries (IDC)	(11) Less Developed (LDC)	(12) EMG
Government budget balance	0.432	0.476	0.419	0.2	0.033	0.304	0.022	-0.011
	[0.111]***	[0.087]***	[0.121]***	[0.071]***	[0.034]	[0.126]**	[0.033]	[0.061]
Net foreign assets (initial)	0.022	0.072	0.017	0.053	-0.007	-0.014	-0.003	0.012
	[0.014]	[0.008]***	[0.015]	[0.015]***	[0.004]*	[0.010]	[0.005]	[0.013]
Relative income	0.015	0	0.036	-0.054	-0.037	-0.006	-0.051	-0.264
	[0.034]	[0.027]	[0.044]	[0.093]	[0.018]**	[0.032]	[0.022]**	[0.075]***
Relative income squared	0.054	-0.176	0.063	-0.238	0	-0.225	0.019	-0.342
	[0.035]	[0.116]	[0.031]**	[0.097]**	[0.018]	[0.155]	[0.018]	[0.071]***
Dependency ratio (young)	-0.06	-0.088	-0.035	-0.057	-0.05	-0.097	-0.033	-0.046
	[0.017]***	[0.025]***	[0.022]	[0.020]***	[0.013]***	[0.026]***	[0.014]**	[0.018]**
Dependency ratio (old)	-0.019	-0.017	-0.007	-0.083	-0.006	-0.058	0.006	-0.013
	[0.015]	[0.021]	[0.017]	[0.020]***	[0.009]	[0.020]***	[0.010]	[0.019]
Financial Develop. (PCGDP)	0.02	0.017	0.073	-0.091	0.037	0.026	0.073	0.046
	[0.017]	[0.011]	[0.059]	[0.053]*	[0.008]***	[0.012]**	[0.031]**	[0.043]
Legal development (LEGAL)	-0.012	0.011	-0.019	-0.034	-0.002	-0.01	0.007	-0.015
	[0.007]*	[0.006]*	[0.012]	[0.015]**	[0.004]	[0.006]*	[0.008]	[0.014]
PCGDP x LEGAL	-0.02	-0.028	-0.016	-0.045	0	-0.003	0.013	0.001
	[0.008]**	[0.013]**	[0.014]	[0.018]**	[0.004]	[0.012]	[0.010]	[0.015]
Financial open. (KAOPEN)	-0.004	-0.004	-0.013	-0.001	-0.011	-0.01	-0.016	-0.006
	[0.006]	[0.005]	[0.012]	[0.010]	[0.003]***	[0.003]***	[0.006]**	[0.007]
KAOPEN x LEGAL	-0.002	0.01	-0.006	0.003	-0.003	0.003	-0.005	-0.004
	[0.001]	[0.003]***	[0.004]	[0.004]	[0.001]***	[0.005]	[0.002]**	[0.003]
KAOPEN x PCGDP	0.007	0.009	0.012	-0.011	-0.001	-0.003	-0.004	0.002
	[0.009]	[0.011]	[0.014]	[0.014]	[0.005]	[0.011]	[0.008]	[0.012]
TOT volatility	-0.024	0.314	-0.051	-0.066	0.017	0.252	-0.003	-0.052
	[0.039]	[0.053]***	[0.044]	[0.035]*	[0.022]	[0.045]***	[0.025]	[0.031]*
Avg. GDP growth	0.692	0.417	0.695	1.129	0.951	0.38	0.944	1.143
	[0.165]***	[0.252]	[0.190]***	[0.169]***	[0.094]***	[0.268]	[0.097]***	[0.127]***
Trade openness	0.021	0.033	0.024	0.033	0.02	0.023	0.025	0.035
	[0.007]***	[0.016]**	[0.013]*	[0.012]***	[0.005]***	[0.012]*	[0.008]***	[0.009]***
Oil exporting countries	0.078	–	0.086	0.032	0.049	–	0.059	0.01
	[0.018]***	–	[0.020]***	[0.017]*	[0.012]***	–	[0.011]***	[0.015]
Dummy for 2001-05	0.007	-0.053	0.062	0.048	-0.028	-0.08	0.013	-0.005
	[0.013]	[0.012]***	[0.017]***	[0.020]**	[0.014]*	[0.021]***	[0.014]	[0.018]
Dummy for 2006-08	0.027	-0.041	0.097	0.045	-0.011	-0.058	0.031	0.014
	[0.015]*	[0.012]***	[0.023]***	[0.026]*	[0.015]	[0.020]***	[0.016]*	[0.020]
Observations	621	174	447	250	621	174	447	250
Adjusted R-squared	0.46	0.63	0.49	0.57	0.35	0.46	0.39	0.5

Table 3: Beta Coefficients in the Current Account Regression

	Full (1)	IDC (2)	LDC (3)	EMG (4)
Gov't budget balance	0.269***	0.223***	0.260***	0.005*
NFA (initial cond.)	0.363***	0.543***	0.279***	0.013**
Relative Income	0.229**	0.057	0.266***	0.025***
Relative Income, sq.	0.079***	0.009	0.032***	0.006**
Relative Dependency Ratio (young)	-0.206**	0.013	-0.121*	-0.009
Relative Dependency Ratio (old)	-0.158**	0.204***	-0.113**	-0.024***
Financial Development (PCGDP)	-0.036	-0.245	0.044	-0.005
LEGAL	-0.164**	-0.053	-0.196**	-0.007
PCGDP x LEGAL	-0.105	-0.177	-0.047	-0.017**
Financial openness (KAOPEN)	-0.104**	-0.612**	-0.173***	-0.006
KAOPEN x LEGAL	0.095***	0.560***	-0.021	0.008
KAOPEN x PCGDP	0.018	0.309***	0.017	-0.010*
TOT volatility	0.001	0.034	-0.017	0.003
output growth, 5-yr average	-0.037	0.053	-0.035	0.002
Trade Openness	-0.007	-0.010	-0.032	0.000
Oil Exporters	0.110**		0.106**	0.012***
Dummy-2005	0.126***	0.104*	0.156**	0.014**
Dummy-2008	0.076	0.011	0.129*	0.006

Notes: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. The p-values are not necessarily similar to those in Table 2-1 since both the dependent and independent variables are standardized in this estimation. Time fixed effects are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table. The estimates shown here are "beta coefficients" which indicate by how many standard deviations the current account balances would change if an explanatory variable changes by one standard deviation.

Table 4: Impacts of "Leveraging" on Current Account Balances

	HH-leverage1 (1)	HH-leverage2 (2)	Gov't-leverage (3)	HH lev.1 & G-leverage (4)	HH lev.2 & G-leverage (5)	HH-lev.1 w/ int. (6)	HH-lev.2 w/ int. (7)	G-lev. w/ int. (8)	HH & G-lev.1 w/ int. (9)	HH & G-lev.2 w/ int. (10)
Gov't budget balance	0.431	0.405	0.331	0.582	0.763	0.438	0.389	0.337	0.619	0.687
	(0.115)***	(0.316)	(0.088)***	(0.121)***	(0.529)	(0.120)***	(0.280)	(0.087)***	(0.125)***	(0.416)
Lane's NFA	0.046	0.006	0.084	0.047	0.007	0.046	-0.004	0.076	0.046	-0.008
(initial cond.)	(0.010)***	(0.026)	(0.009)***	(0.009)***	(0.023)	(0.010)***	(0.025)	(0.010)***	(0.010)***	(0.019)
Relative income	0.030	0.102	0.030	-0.002	0.095	0.029	0.106	0.043	-0.008	0.101
	(0.041)	(0.056)*	(0.022)	(0.037)	(0.051)*	(0.042)	(0.052)*	(0.023)*	(0.040)	(0.042)**
Relative income sq.	0.057	-0.150	-0.011	0.014	-0.133	0.059	-0.189	0.017	0.020	-0.128
	(0.101)	(0.196)	(0.071)	(0.091)	(0.213)	(0.102)	(0.202)	(0.066)	(0.107)	(0.179)
Young dependency	-0.074	-0.001	-0.041	-0.065	-0.000	-0.076	-0.001	-0.025	-0.064	-0.006
ratio	(0.040)*	(0.061)	(0.026)	(0.038)*	(0.062)	(0.041)*	(0.060)	(0.024)	(0.039)	(0.059)
Old dependency ratio	0.045	0.187	0.003	0.052	0.192	0.043	0.146	0.006	0.044	0.208
	(0.030)	(0.056)***	(0.020)	(0.030)*	(0.056)***	(0.031)	(0.054)**	(0.018)	(0.031)	(0.043)***
Fin Dev. - PCGDP	-0.027	-0.020	-0.016	-0.036	-0.022	-0.028	-0.022	-0.010	-0.040	-0.010
	(0.012)**	(0.029)	(0.011)	(0.012)***	(0.028)	(0.013)**	(0.026)	(0.011)	(0.012)***	(0.023)
Legal/Institutional	0.021	0.032	0.006	0.028	0.032	0.021	0.024	0.004	0.028	0.025
variable	(0.005)***	(0.012)**	(0.006)	(0.007)***	(0.012)**	(0.005)***	(0.014)*	(0.005)	(0.006)***	(0.013)*
pcgdp x legal	0.036	0.045	-0.019	0.047	0.050	0.036	0.046	-0.013	0.051	0.053
	(0.014)**	(0.015)***	(0.013)	(0.011)***	(0.015)***	(0.014)**	(0.016)***	(0.010)	(0.012)***	(0.014)***
Financial Openness	0.006	-0.022	0.004	0.001	-0.025	0.007	-0.026	0.002	0.002	-0.041
(KAOPEN)	(0.011)	(0.024)	(0.004)	(0.011)	(0.025)	(0.011)	(0.024)	(0.003)	(0.011)	(0.021)*
KAOPEN x legal	0.029	0.027	0.016	0.019	0.019	0.029	0.024	0.015	0.017	0.027
	(0.008)***	(0.016)	(0.004)***	(0.008)**	(0.019)	(0.008)***	(0.015)	(0.003)***	(0.008)**	(0.017)
KAOPEN x pcgdp	-0.022	-0.021	0.004	-0.025	-0.022	-0.022	-0.030	-0.000	-0.027	-0.051
	(0.011)*	(0.036)	(0.011)	(0.009)***	(0.038)	(0.011)*	(0.038)	(0.008)	(0.011)**	(0.031)
Dummy-2005	0.012	0.001	0.010	0.010	-0.008	0.012	0.002	0.007	0.009	-0.001
	(0.009)	(0.011)	(0.008)	(0.009)	(0.015)	(0.009)	(0.011)	(0.007)	(0.010)	(0.014)
Dummy-2008	0.002	-0.009	0.002	0.007	-0.013	0.005	0.011	-0.001	0.018	0.009
	(0.010)	(0.013)	(0.010)	(0.008)	(0.014)	(0.012)	(0.017)	(0.010)	(0.011)	(0.016)
HH's leverage 1	-0.183			-0.248		-0.177			-0.243	
	(0.109)*			(0.091)***		(0.109)[11%]			(0.090)***	
HH's leverage 2 (mortgage)		0.029			-0.001		0.005			-0.012
		(0.052)			(0.060)		(0.060)			(0.065)
Govt's leverage			-0.097	0.178	0.277			-0.009	0.190	0.057
			(0.050)*	(0.078)**	(0.237)			(0.042)	(0.097)*	(0.216)
HH-lev1 x d2008						-0.044			-0.121	
						(0.073)			(0.069)*	
HH-lev2 x d2008							-0.200			-0.137
							(0.153)			(0.111)
Gov't-lev x d2008								-0.354	-0.004	0.533
								(0.120)***	(0.130)	(0.214)**
R^2	0.90	0.91	0.72	0.91	0.92	0.90	0.92	0.75	0.92	0.94
N	65	40	148	65	40	65	40	148	65	40

Notes: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. The estimates for GDP growth, TOT volatility, and trade openness are omitted to conserve space.

Table 5: Out-of-sample Predictions Errors and Probabilities

(a) Industrialized countries

	1991-95		1996-2000		2001-05		2006-08	
	Pred. errors	p-values	Pred. errors	p-values	Pred. errors	p-values	Pred. errors	p-values
Australia	0.2%	0.463	-0.5%	0.433	-2.1%	0.293	-1.6%	0.328
Austria	-1.0%	0.347	-1.6%	0.269	2.6%	0.246	2.7%	0.218
Belgium	4.0%	**0.045**	4.0%	0.063	0.5%	0.448	-2.9%	0.208
Canada	0.4%	0.433	2.2%	0.204	2.0%	0.302	1.6%	0.330
Denmark	4.9%	**0.029**	2.9%	0.145	3.2%	0.198	0.2%	0.482
Finland	2.2%	0.194	8.8%	**0.001**	10.1%	**0.005**	1.1%	0.384
France	2.3%	0.159	3.8%	0.070	0.9%	0.407	-0.7%	0.421
Germany	-3.1%	0.102	-1.4%	0.292	2.1%	0.285	5.0%	0.076
Greece	0.0%	0.496	-4.6%	0.085	-3.3%	0.215	-5.9%	0.057
Iceland	3.9%	0.053	-1.8%	0.245	-1.9%	0.314	-17.2%	**0.001**
Ireland	5.2%	**0.040**	1.4%	0.335	-1.0%	0.395	-2.7%	0.239
Italy	-1.0%	0.380	0.7%	0.418	0.0%	0.498	-0.1%	0.490
Japan	-0.5%	0.413	0.5%	0.427	1.4%	0.361	1.3%	0.362
Malta	-5.2%	**0.032**	-7.8%	**0.012**	-1.9%	0.330	-6.6%	**0.046**
Netherlands	1.4%	0.311	2.5%	0.230	5.5%	0.077	6.9%	**0.027**
New Zealand	1.5%	0.279	0.6%	0.419	-1.4%	0.354	-2.7%	0.225
Norway	3.3%	0.116	5.5%	**0.036**	9.5%	**0.011**	5.6%	0.102
Portugal	-0.7%	0.418	-8.3%	**0.005**	-5.6%	0.090	-4.5%	0.126
Spain	-1.6%	0.286	-2.3%	0.237	-3.7%	0.177	-6.0%	0.059
Sweden	1.8%	0.233	5.1%	**0.027**	3.6%	0.172	6.1%	**0.040**
Switzerland	--	--	5.2%	**0.045**	4.6%	0.123	0.2%	0.473
United Kingdom	-1.0%	0.338	-0.4%	0.436	-1.8%	0.310	-1.7%	0.313
United States	0.3%	0.454	-2.2%	0.209	-3.4%	0.194	-3.4%	0.184
Subsample average	0.8%	0.255	0.5%	0.202	0.9%	0.252	-1.1%	0.226
# of countries w. $p < 0.05$		4		6		2		4
# of countries w. lowest p.		5		8		5		9

Table 5 (continued): Out-of-sample Predictions Errors and Probabilities

(b) Emerging market countries

	1991-95		1996-2000		2001-05		2006-08	
	Pred. errors	p-values	Pred. errors	p-values	Pred. errors	p-values	Pred. errors	p-values
Argentina	-2.5%	0.299	-5.4%	0.118	7.5%	**0.038**	--	--
Bangladesh	--	--	--	--	2.1%	0.314	2.5%	0.260
Botswana	8.9%	0.057	5.5%	0.139	3.9%	0.214	10.2%	**0.010**
Brazil	5.3%	0.114	-1.3%	0.370	2.5%	0.276	3.2%	0.198
Bulgaria	7.0%	0.083	3.4%	0.218	-1.9%	0.335	-17.8%	**0.000**
Chile	0.6%	0.448	0.6%	0.437	1.7%	0.337	3.3%	0.191
China	1.9%	0.326	4.5%	0.122	4.1%	0.158	10.2%	**0.003**
Colombia	1.8%	0.327	-0.1%	0.488	1.8%	0.332	0.0%	0.497
Cote d'Ivoire	0.8%	0.441	3.7%	0.194	7.3%	**0.043**	--	--
Ecuador	-0.5%	0.458	3.3%	0.198	3.0%	0.242	8.4%	**0.017**
Egypt, Arab Rep.	8.6%	**0.019**	1.1%	0.386	5.7%	0.080	3.6%	0.170
Ghana	-1.6%	0.356	-2.1%	0.302	2.8%	0.262	-10.1%	**0.004**
Hong Kong, China	-1.5%	0.426	1.2%	0.406	2.9%	0.279	-2.7%	0.301
Hungary	5.4%	0.135	-6.1%	0.094	-6.1%	0.115	-2.2%	0.316
India	1.9%	0.324	1.0%	0.399	2.8%	0.245	-0.3%	0.468
Indonesia	7.1%	0.116	5.7%	0.084	8.7%	**0.028**	6.4%	0.059
Israel	-1.0%	0.412	-1.1%	0.401	2.7%	0.256	4.2%	0.140
Jamaica	2.8%	0.272	0.4%	0.461	-2.1%	0.321	--	--
Jordan	-4.4%	0.205	3.5%	0.195	2.9%	0.240	-10.9%	**0.002**
Kenya	0.8%	0.433	-11.6%	**0.005**	1.6%	0.358	-2.1%	0.294
Korea, Rep.	-2.6%	0.271	2.0%	0.317	0.2%	0.478	-1.9%	0.308
Malaysia	-5.2%	0.097	10.1%	**0.007**	12.6%	**0.002**	16.2%	**0.000**
Mexico	-4.6%	0.147	-1.5%	0.362	1.7%	0.340	1.9%	0.307
Morocco	1.0%	0.400	2.3%	0.277	5.3%	0.101	-0.5%	0.450
Nigeria	4.7%	0.202	11.3%	**0.008**	16.7%	**0.000**	--	--
Pakistan	-0.5%	0.446	1.8%	0.320	5.5%	0.096	-4.1%	0.134
Peru	-4.2%	0.192	-1.3%	0.388	5.1%	0.127	5.1%	0.109
Philippines	-0.9%	0.419	0.4%	0.464	4.2%	0.164	7.2%	**0.032**
Poland	7.8%	**0.041**	-2.5%	0.276	0.1%	0.492	-1.0%	0.397
Singapore	10.4%	0.058	11.6%	**0.028**	9.1%	**0.049**	3.5%	0.289
South Africa	3.5%	0.204	2.5%	0.280	0.0%	0.496	-7.4%	**0.028**
Sri Lanka	-1.7%	0.364	-0.2%	0.480	2.7%	0.269	-2.0%	0.302
Thailand	-5.0%	0.113	8.9%	**0.017**	4.4%	0.144	4.2%	0.132
Trinidad and Tobago	8.1%	0.070	-1.7%	0.369	10.4%	**0.022**	29.2%	**0.000**
Tunisia	-0.1%	0.491	2.3%	0.282	1.2%	0.393	0.3%	0.471
Turkey	0.6%	0.446	1.1%	0.393	3.4%	0.219	--	--
Venezuela, RB	1.9%	0.356	2.4%	0.318	12.9%	**0.002**	--	--
Zimbabwe	-1.4%	0.362	0.7%	0.429	--	--	--	--
Subsample average	1.4%	0.268	1.5%	0.271	4.0%	0.213	1.8%	0.190
# of countries w. $p < 0.05$		2		5		8		10
# of countries w. lowest p.		15		12		18		21

Table 6: Determinants of the Out-of-Sample Prediction Errors of CAB

Dependent variable = Out-of-sample Prediction errors									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Average Change in Stock market development (SMTV) in 2002-06	-0.319 [0.133]**	-0.295 [0.130]**	-0.128 [0.101]	-0.225 [0.132]*	-0.060 (0.078)	-0.117 (0.092)	-0.102 (0.080)	-0.168 (0.100)	-0.060 (0.078)
Fiscal Procyclicality in 2006-08	-0.006 [0.017]	-0.022 [0.018]	0.011 [0.016]	-0.005 [0.018]	0.015 (0.014)	0.003 (0.016)	0.014 (0.013)	-0.001 (0.015)	0.015 (0.014)
Dummy for the Fixed/Pegged Exchange Rate Regime	-0.037 [0.022]*	-0.046 [0.023]*	-0.019 [0.018][12%]	-0.028 [0.017]	-0.021 (0.015)	-0.029 (0.014)*	-0.013 (0.016)	-0.021 (0.015)	-0.021 (0.015)
Int'l Reserves (% of GDP) as of 2005	0.093 [0.050]*	0.051 [0.045]	0.083 [0.057]	0.05 [0.043]	0.015 (0.041)	-0.004 (0.039)	0.050 (0.049)	0.030 (0.039)	0.015 (0.041)
Real Interest Rate as of 2005	-0.083 [0.117]	-0.054 [0.115]	-0.051 [0.071]	-0.045 [0.074]	-0.125 (0.069)*	-0.117 (0.076)	-0.137 (0.072)*	-0.121 (0.073)	-0.125 (0.069)*
Average Change in Private bond market development (PVBM) in 2002-06			-0.281 [0.055]***	-0.617 [0.318]*				-0.421 (0.234)*	-0.438 (0.245)*
Average Change in Public bond market development (PBBM) in 2002-06			-0.065 [0.238]	-0.218 [0.252]				-0.484 (0.192)**	-0.528 (0.193)**
Average Housing Appreciation Rate in 2002-06						-0.730 (0.163)***	-0.698 (0.175)***	-0.656 (0.121)***	-0.593 (0.115)***
Dummy for the U.S.		-0.118 [0.037]***		-0.071 [0.034]**			-0.066 (0.030)**		-0.062 (0.031)*
Dummy for China		0.111 [0.022]***		0.103 [0.017]***			0.068 (0.011)***		0.075 (0.012)***
Dummy for Greece		-0.065 [0.023]***		-0.064 [0.018]***			-0.050 (0.014)***		-0.065 (0.012)***
Dummy for Iceland		-0.121 [0.035]***		0.193 [0.173]			-- --		-- --
Observations	58	58	36	36	35	35	35	31	31
Adjusted R-squared	0.20	0.31	0.47	0.61	0.56	0.62	0.57	0.69	0.56

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1

Table 7: Forecasts of Current Account Balances for 2012-16

	CAB as of 2006-08	IMF Projection for 2012-16	Change from 2006-08	Forecast (2008)[n]	Change from 2006-08	Difference from IMF projection	Forecast (2005)[n]	Change from 2006-08	Difference from IMF projection
	(1)	(2)	(3)=(2)-(1)	(4)	(5)=(4)-(1)	(6)=(4)-(2)	(7)	(8)=(7)-(1)	(9)=(7)-(2)
Industrial Countries									
Australia	-5.7%	-5.6%	0.1%	-4.2%	1.5%	1.5%	-4.4%	1.3%	1.2%
Austria	3.0%	2.8%	-0.2%	0.2%	-2.8%	-2.6%	-0.6%	-3.6%	-3.4%
Belgium	0.4%	1.7%	1.3%	2.8%	2.4%	1.1%	1.8%	1.4%	0.1%
Canada	2.2%	-3.0%	-5.3%	0.0%	-2.2%	3.1%	-0.4%	-2.7%	2.6%
Denmark	1.9%	5.9%	4.0%	0.8%	-1.1%	-5.1%	-0.4%	-2.3%	-6.3%
Finland	3.9%	2.5%	-1.4%	4.5%	0.7%	2.0%	1.4%	-2.4%	-1.0%
France	-1.2%	-2.5%	-1.3%	0.1%	1.4%	2.6%	-1.2%	0.0%	1.3%
Germany	7.0%	4.5%	-2.5%	2.8%	-4.2%	-1.8%	1.4%	-5.6%	-3.1%
Greece	-13.2%	-4.8%	8.5%	-10.5%	2.7%	-5.8%	-8.5%	4.7%	-3.7%
Iceland	-27.8%	0.0%	27.7%	-22.1%	5.6%	-22.1%	-13.0%	14.8%	-13.0%
Ireland	-4.5%	1.4%	5.9%	-4.6%	-0.1%	-6.0%	-3.9%	0.6%	-5.3%
Italy	-2.8%	-2.3%	0.5%	-3.9%	-1.1%	-1.6%	-3.3%	-0.4%	-1.0%
Japan	4.0%	2.5%	-1.5%	3.9%	0.0%	1.4%	1.7%	-2.3%	-0.8%
Malta	-7.7%	-5.6%	2.2%	-2.4%	5.3%	3.1%	-1.1%	6.6%	4.5%
Netherlands	8.3%	6.8%	-1.4%	1.1%	-7.2%	-5.7%	0.3%	-7.9%	-6.5%
New Zealand	-8.3%	-6.4%	1.9%	-5.7%	2.6%	0.7%	-6.2%	2.2%	0.2%
Norway	17.1%	11.7%	-5.4%	11.7%	-5.4%	0.0%	8.9%	-8.2%	-2.8%
Portugal	-10.6%	-4.5%	6.0%	-7.5%	3.1%	-2.9%	-6.8%	3.8%	-2.2%
Spain	-9.6%	-2.6%	7.0%	-6.4%	3.2%	-3.8%	-5.9%	3.7%	-3.3%
Sweden	8.5%	5.0%	-3.5%	4.5%	-4.0%	-0.5%	2.0%	-6.5%	-3.0%
Switzerland	11.1%	10.5%	-0.6%	12.6%	1.5%	2.1%	10.0%	-1.1%	-0.5%
United Kingdom	-2.6%	-1.3%	1.3%	-0.8%	1.8%	0.5%	-1.7%	0.9%	-0.4%
United States	-5.4%	-2.1%	3.2%	-3.8%	1.5%	-1.7%	-3.4%	2.0%	-1.3%
Emerging Market Economies									
Argentina	2.9%	-1.1%	-3.9%	0.5%	-2.4%	1.6%	-2.5%	-5.4%	-1.4%
Bangladesh	1.5%	-0.7%	-2.2%	0.0%	-1.5%	0.7%	-2.6%	-4.1%	-1.9%
Botswana	13.7%	0.8%	-13.0%	7.5%	-6.3%	6.7%	2.1%	-11.6%	1.3%
Brazil	-0.1%	-3.0%	-2.9%	-0.8%	-0.6%	2.2%	-3.9%	-3.7%	-0.9%
Bulgaria	-23.0%	-2.1%	21.0%	-5.0%	18.1%	-2.9%	-6.9%	16.1%	-4.8%
Cote d'Ivoire	1.4%	-2.1%	-3.4%	-3.0%	-4.4%	-0.9%	-5.3%	-6.6%	-3.2%
Chile	2.4%	-1.9%	-4.3%	2.1%	-0.3%	4.0%	-1.5%	-3.9%	0.4%
China	10.1%	6.5%	-3.6%	2.6%	-7.5%	-3.9%	0.1%	-10.0%	-6.5%
Colombia	-2.5%	-2.2%	0.3%	-1.3%	1.2%	0.9%	-4.2%	-1.7%	-2.0%
Ecuador	3.2%	-3.3%	-6.5%	-3.3%	-6.5%	0.0%	-7.0%	-10.1%	-3.6%

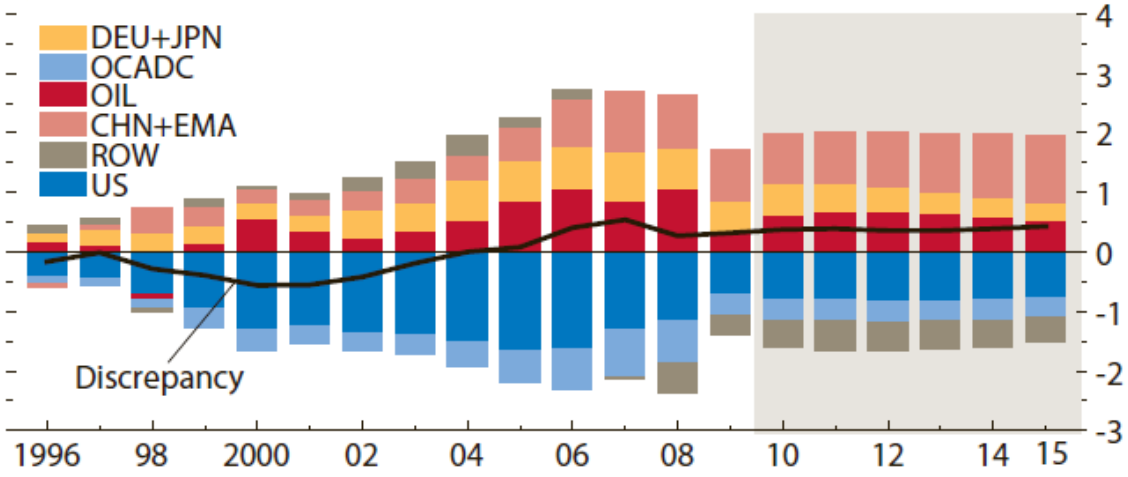
Continues to the next page

Table 7 (continued): Forecasts of Current Account Balances for 2012-16

	CAB as of 2006-08 (1)	IMF Projection for 2012-16 (2)	Change from 2006-08 (3)=(2)-(1)	Forecast (2008)[n] (4)	Change from 2006-08 (5)=(4)-(1)	Difference from IMF projection (6)=(4)-(2)	Forecast (2005)[n] (7)	Change from 2006-08 (8)=(7)-(1)	Difference from IMF projection (9)=(7)-(2)
Egypt, Arab Rep.	0.6%	-2.1%	-2.7%	-1.7%	-2.3%	0.4%	-4.2%	-4.8%	-2.1%
Ghana	-14.8%	-2.5%	12.4%	-3.7%	11.2%	-1.2%	-5.6%	9.2%	-3.2%
Hong Kong, China	12.9%	6.4%	-6.5%	25.8%	12.9%	19.4%	21.0%	8.1%	14.6%
Hungary	-7.5%	-0.3%	7.2%	-2.5%	5.0%	-2.3%	-5.8%	1.7%	-5.6%
India	-1.7%	-2.3%	-0.6%	-0.3%	1.3%	1.9%	-2.7%	-1.0%	-0.4%
Indonesia	1.8%	-0.9%	-2.7%	-1.9%	-3.7%	-1.0%	-5.6%	-7.5%	-4.8%
Israel	2.8%	1.4%	-1.4%	0.4%	-2.4%	-1.0%	-1.8%	-4.6%	-3.2%
Jamaica	-14.5%	-5.1%	9.4%	-4.2%	10.2%	0.9%	-7.1%	7.3%	-2.0%
Jordan	-13.2%	-6.5%	6.7%	-1.6%	11.6%	4.8%	-3.2%	10.0%	3.3%
Kenya	-4.0%	-6.1%	-2.2%	0.1%	4.1%	6.2%	-3.3%	0.7%	2.9%
Korea, Rep.	0.1%	1.2%	1.1%	6.7%	6.5%	5.5%	3.1%	3.0%	1.9%
Malaysia	17.3%	9.6%	-7.6%	2.5%	-14.8%	-7.2%	0.0%	-17.2%	-9.6%
Mexico	-0.9%	-0.9%	0.0%	0.1%	1.0%	1.0%	-4.1%	-3.2%	-3.2%
Morocco	-1.5%	-3.1%	-1.6%	-0.9%	0.6%	2.2%	-2.9%	-1.3%	0.3%
Nigeria	19.3%	8.2%	-11.1%	-1.3%	-20.6%	-9.5%	-4.1%	-23.4%	-12.3%
Pakistan	-6.8%	-2.5%	4.3%	-1.6%	5.1%	0.9%	-3.7%	3.1%	-1.2%
Peru	0.4%	-2.7%	-3.1%	-1.5%	-1.9%	1.2%	-5.6%	-6.0%	-2.9%
Philippines	4.0%	1.3%	-2.7%	-2.1%	-6.1%	-3.3%	-4.5%	-8.5%	-5.8%
Poland	-4.3%	-5.2%	-0.9%	-0.7%	3.6%	4.6%	-3.7%	0.6%	1.5%
Singapore	19.9%	16.3%	-3.6%	27.6%	7.7%	11.3%	20.0%	0.1%	3.7%
South Africa	-7.1%	-4.9%	2.2%	1.5%	8.5%	6.4%	-1.4%	5.6%	3.5%
Sri Lanka	-6.3%	-3.1%	3.2%	-4.5%	1.8%	-1.3%	-6.2%	0.1%	-3.1%
Thailand	2.6%	1.1%	-1.5%	-0.5%	-3.1%	-1.6%	-2.9%	-5.5%	-4.0%
Trinidad and Tobago	31.9%	17.9%	-13.9%	7.5%	-24.4%	-10.5%	0.4%	-31.5%	-17.5%
Tunisia	-2.9%	-4.7%	-1.7%	-0.2%	2.8%	4.5%	-3.7%	-0.7%	1.0%
Turkey	-5.7%	-6.9%	-1.2%	-0.9%	4.7%	5.9%	-3.8%	1.9%	3.1%
Venezuela, RB	12.0%	4.2%	-7.8%	0.5%	-11.5%	-3.7%	-2.1%	-14.1%	-6.3%
Average	0.2%	0.2%	0.0%	0.2%	0.0%	0.0%	-1.8%	-2.0%	-2.0%
Standard Deviation	10.2%	5.4%	-4.8%	7.0%	-3.2%	1.6%	5.6%	-4.6%	0.2%
Avg. of Surplus Countries[n]	7.4%	3.6%	-3.8%	3.7%	-3.7%	0.1%	0.8%	-6.6%	-2.8%
S.D. of Surplus Countries[n]	7.6%	5.5%	-2.1%	7.3%	-0.3%	1.8%	6.5%	-1.1%	1.0%
Avg. of Deficit Countries[n]	-7.5%	-3.4%	4.1%	-3.4%	4.1%	0.0%	-4.5%	2.9%	-1.2%
S.D. of Deficit Countries[n]	6.5%	2.1%	-4.4%	4.5%	-2.0%	2.4%	2.5%	-4.0%	0.3%

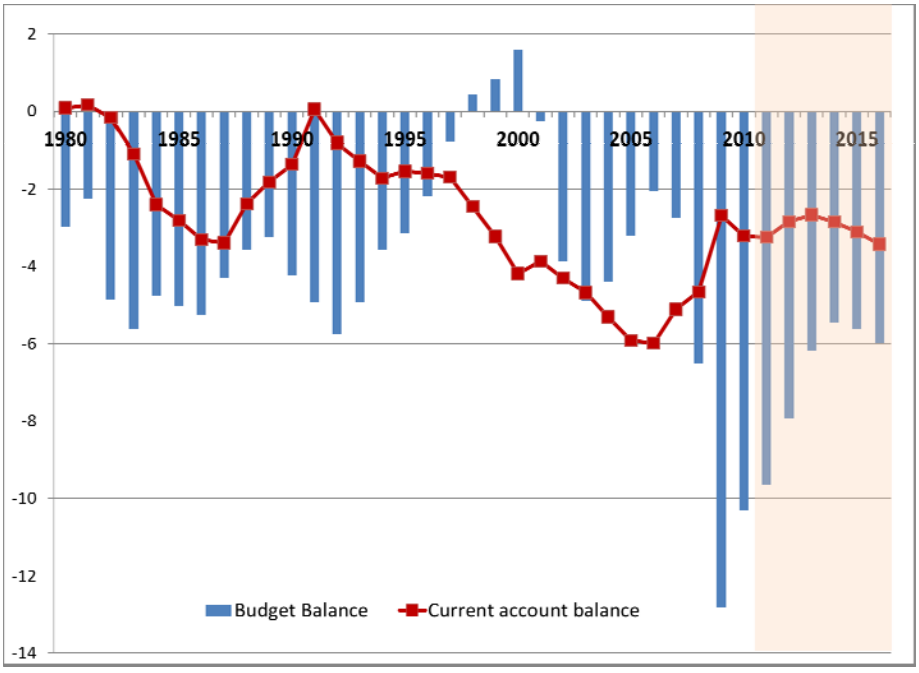
Notes: "Forecast (2008)" and "Forecast (2005)" are the forecasts made using data through 2008 and 2005, respectively. "Surplus countries" refer to the countries that ran current account surplus in the 2006-08 period, and "deficit countries" to those which ran current account deficit in the period. IMF projections are extracted froim WEO September 2011

Figure 1: Current Account Balances as a Share of World GDP



Source: IMF, *World Economic Outlook*, September 2011.
Notes: 2011-2016 data are IMF projections. 'US' is United States, 'OIL' is oil exporting countries, 'DEU+JPN' is Germany plus Japan, 'OCADC' is other advanced developed countries (as defined in WEO), 'CHN+EMA' is China plus other emerging Asia, and 'ROW' is rest of the world.

Figure 2: U.S. Budget and Current Account Balances (% of GDP)



Note**:** 2010-2016 data are IMF projections.

Source: IMF, *World Economic Outlook*, September 2011.

Figure 3: Estimated Contributions to Current Accounts Balances

(Using the Estimates from Model 2)

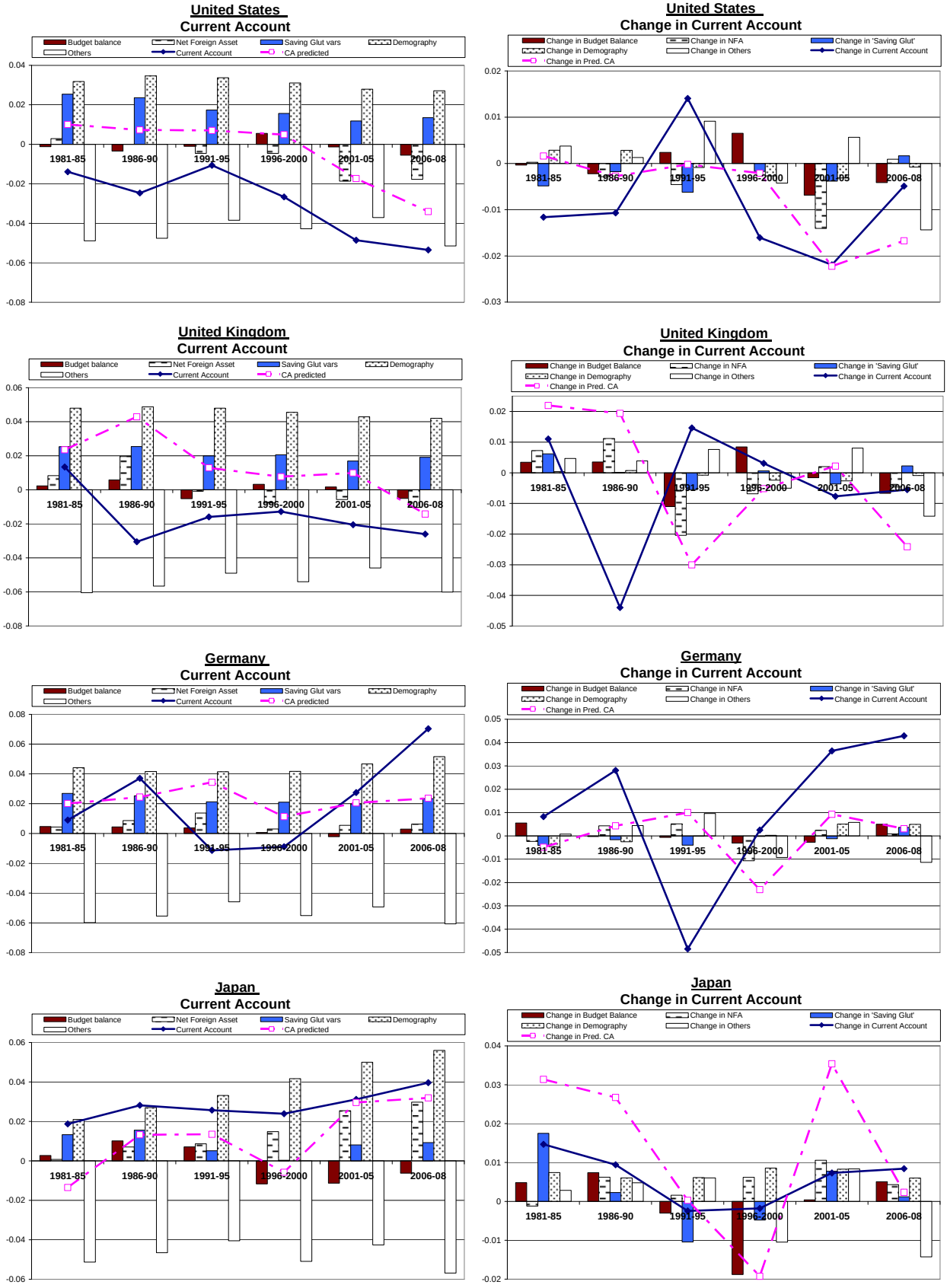
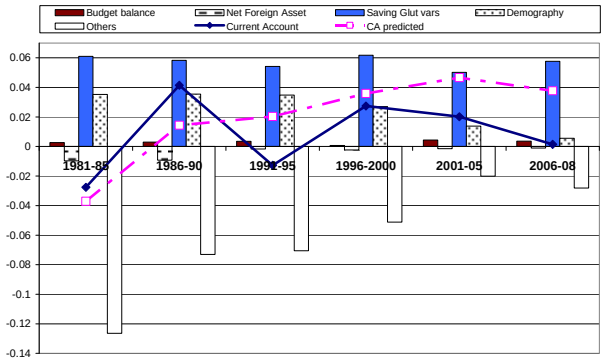
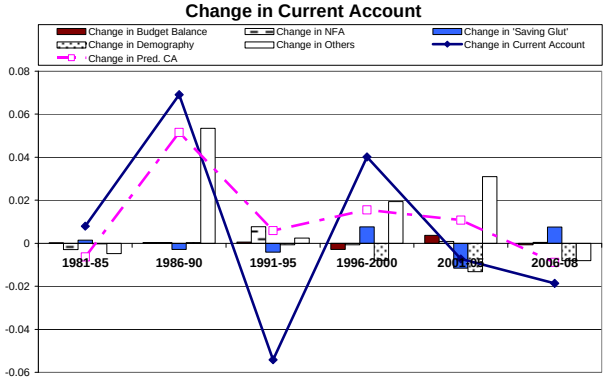


Figure 3 (continued): Estimated Contributions to Current Accounts Balances
(using the Estimates from Model 2)

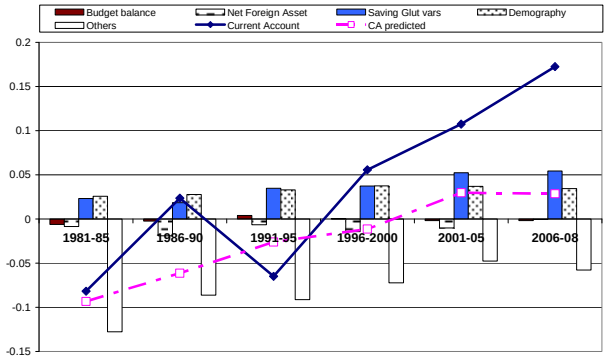
Korea
Current Account



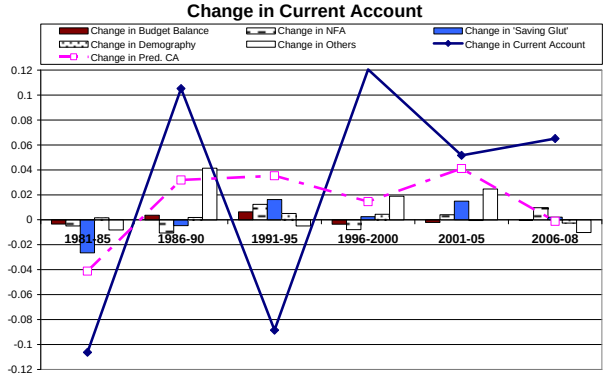
Korea
Change in Current Account



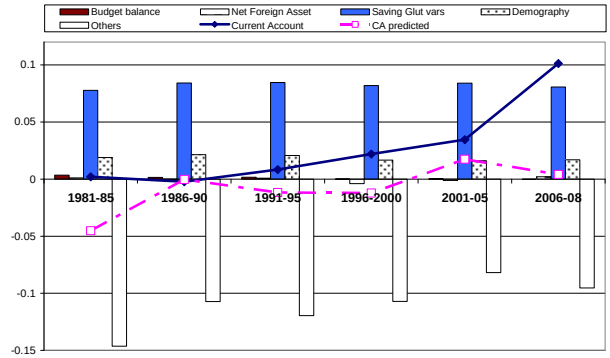
Malaysia
Current Account



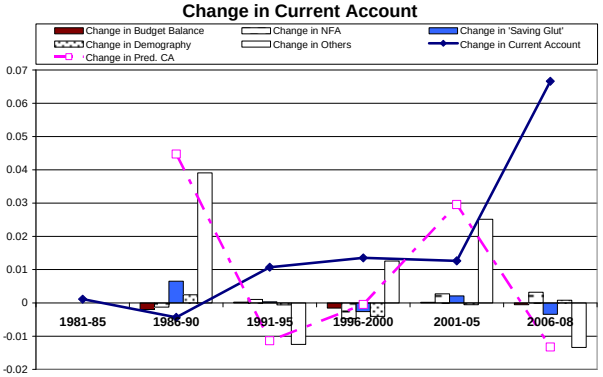
Malaysia
Change in Current Account



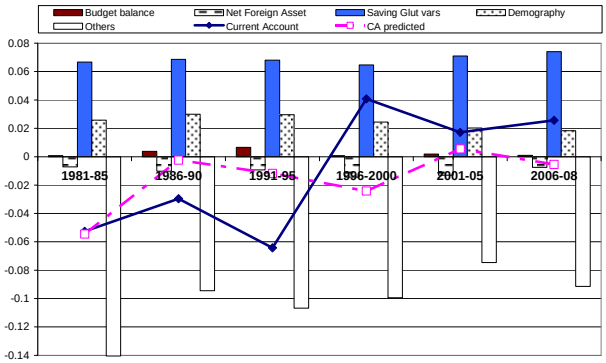
China
Current Account



China
Change in Current Account



Thailand
Current Account



Thailand
Change in Current Account

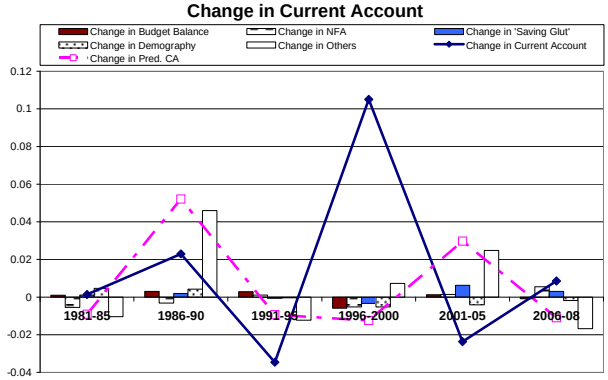
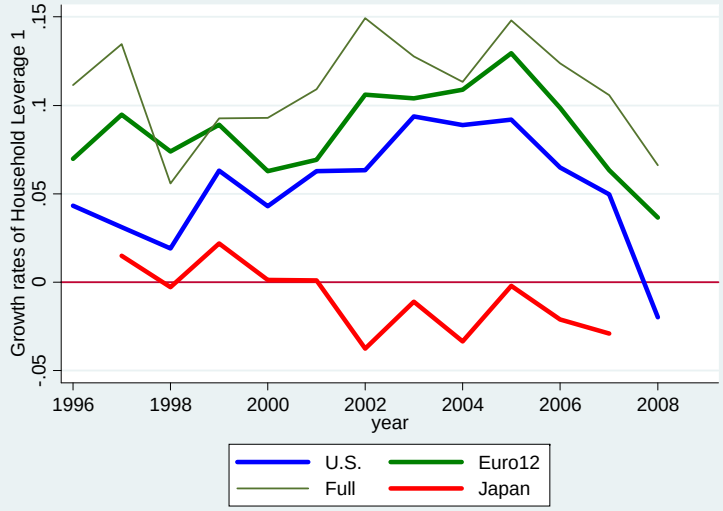
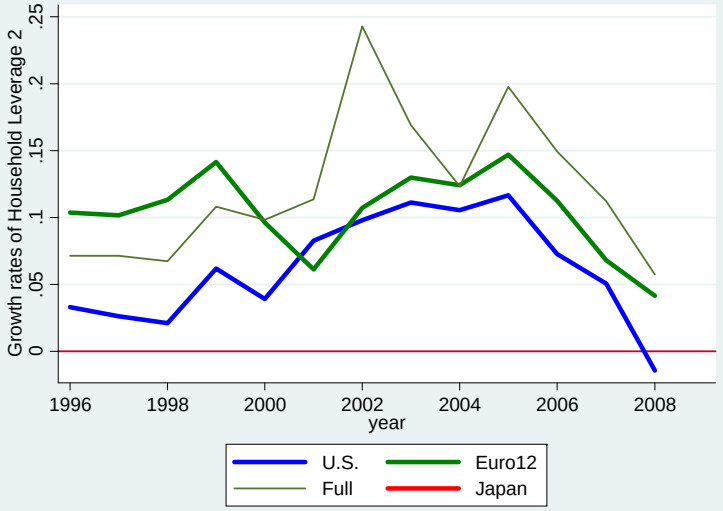


Figure 4: Growth Rates of 'Leverage'

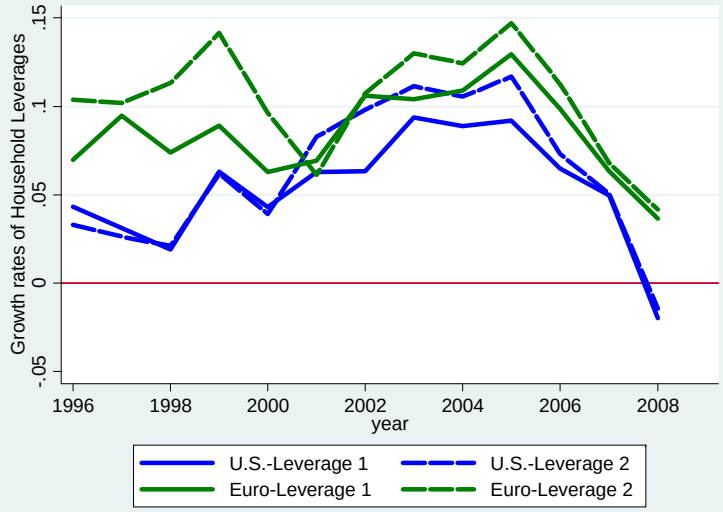
(a) Growth rates of HH Leverage 1



(b) Growth rates of HH Leverage 2



(c) Growth rates of HH Leverages 1and 2



(d) Growth rates of Government Leverage

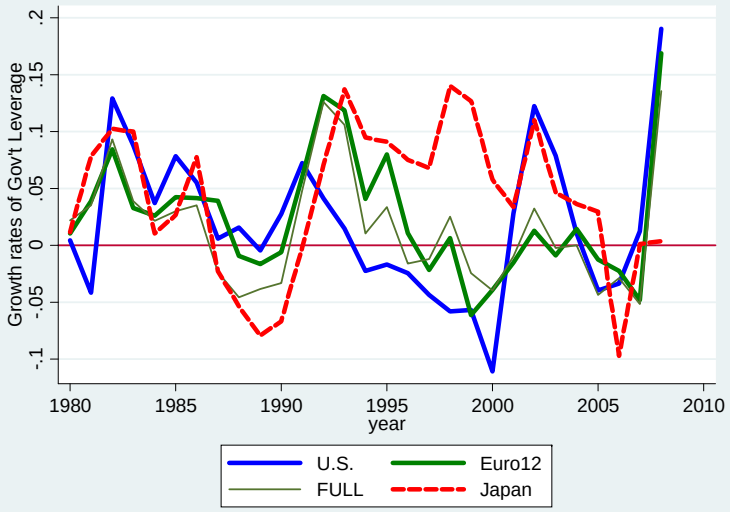
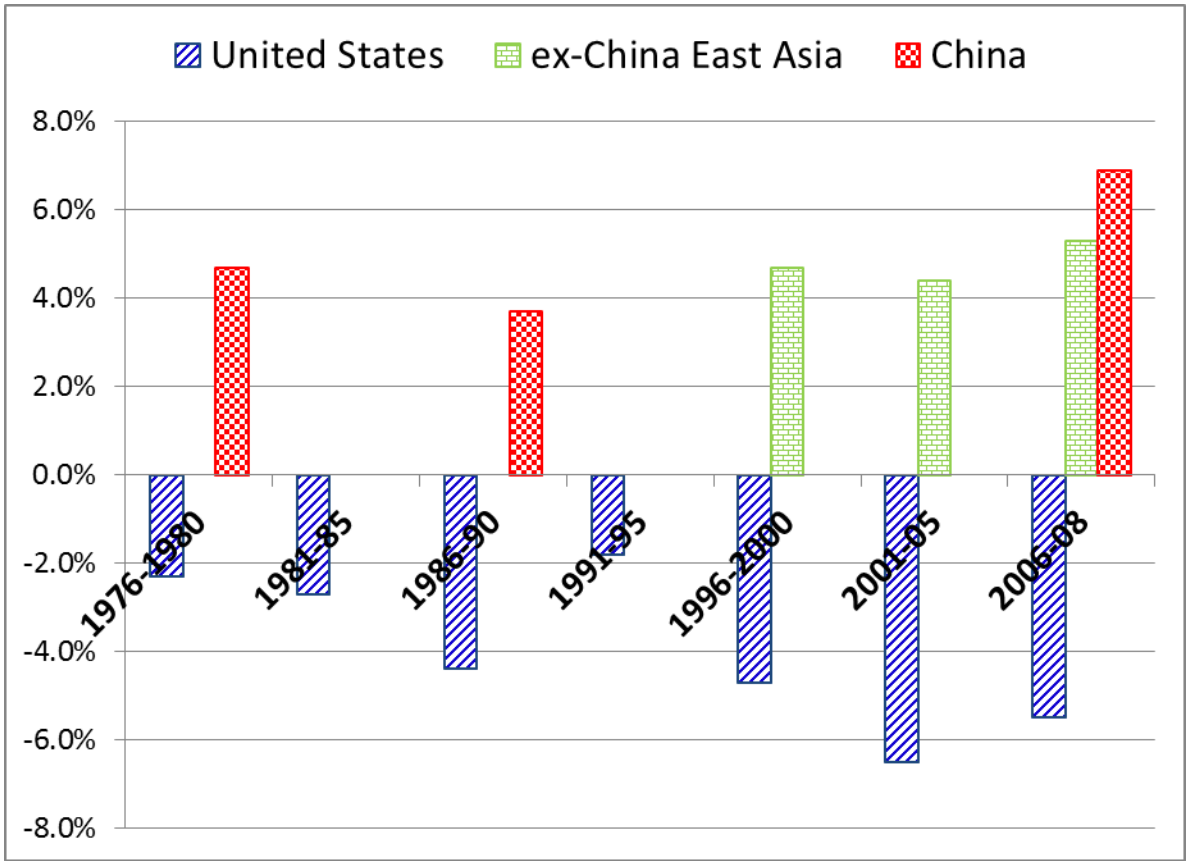


Figure 5: The Estimates on the Interactions Between Country/Area Dummies and Time Fixed Effects



Note: Insignificant estimates are shown as "zeros" in the figure.

Figure 6: In-sample Predictions of Current Accounts (using the Estimates from Model 2)

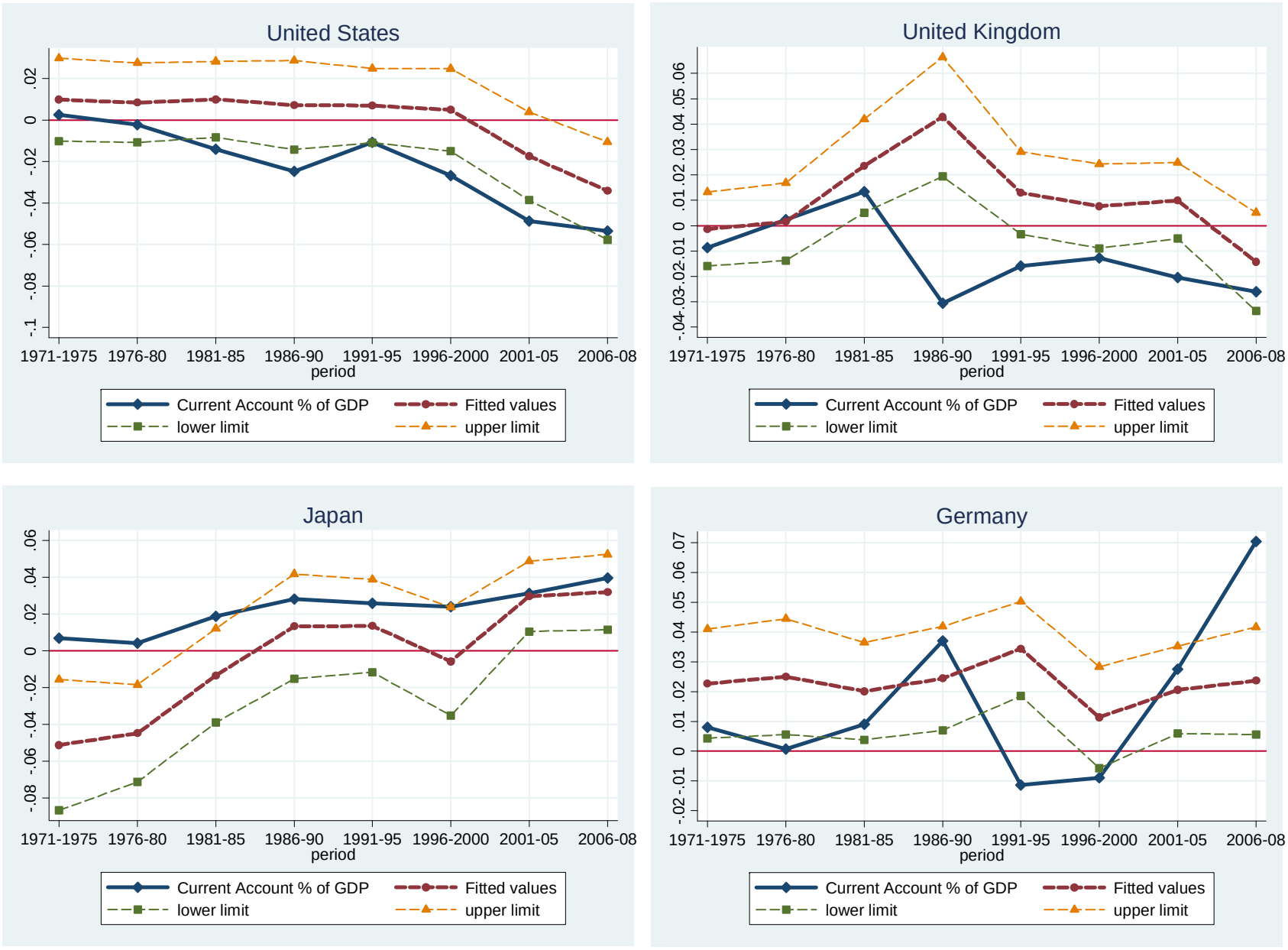


Figure 6 (cont'd): In-sample Predictions of Current Accounts (using the Estimates from Model 2)

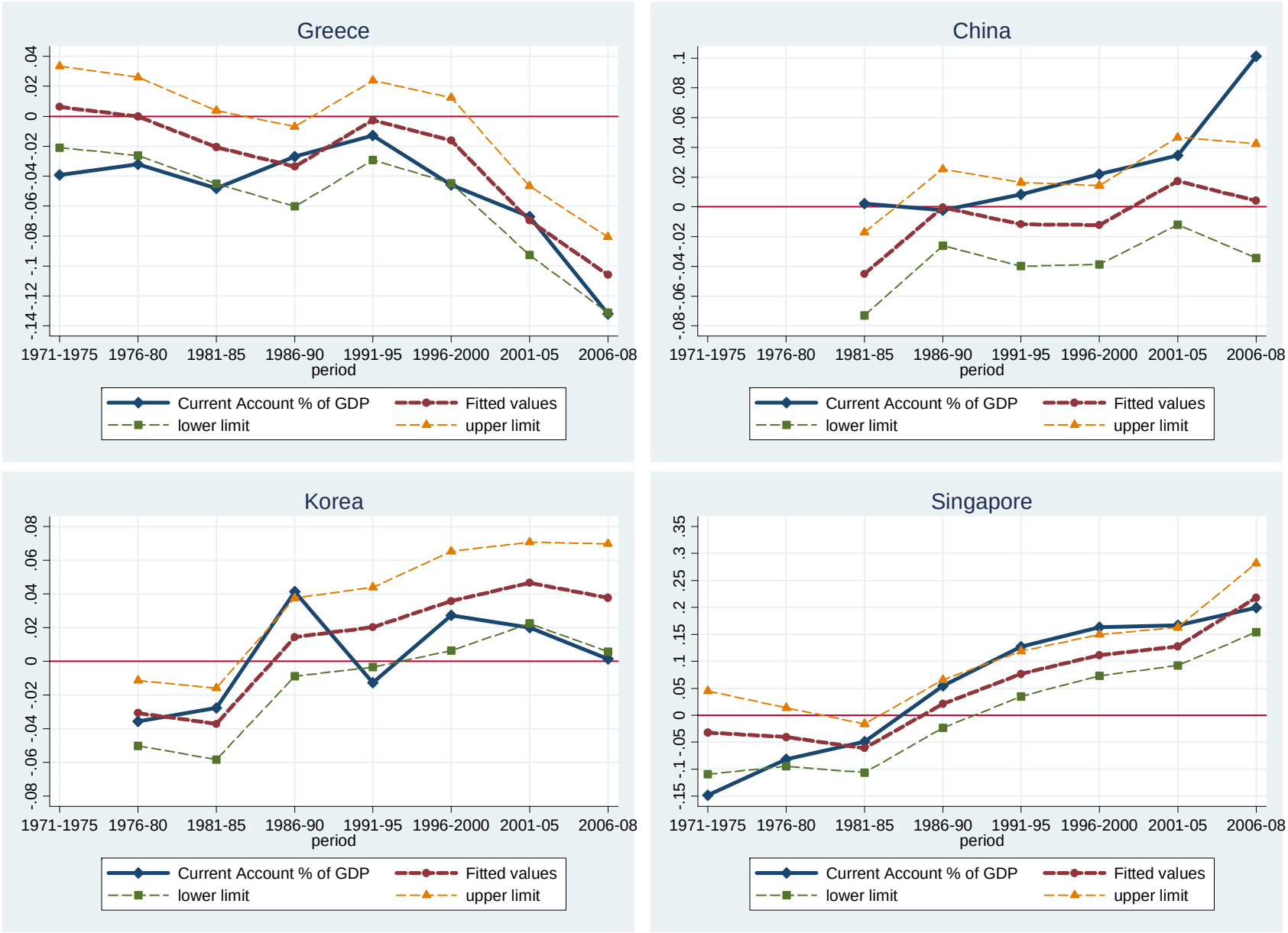


Figure 7: Distributions of Prediction Errors

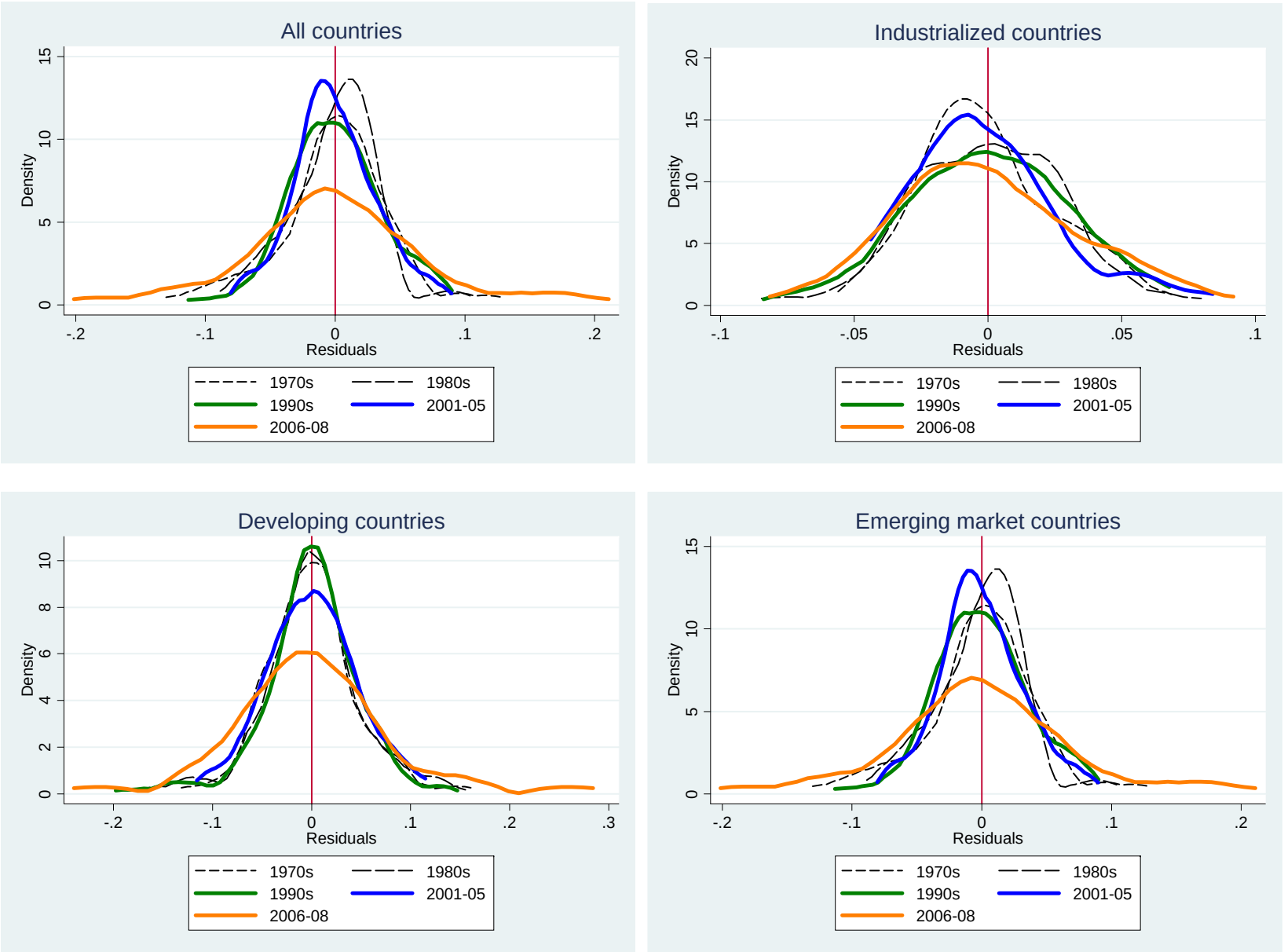
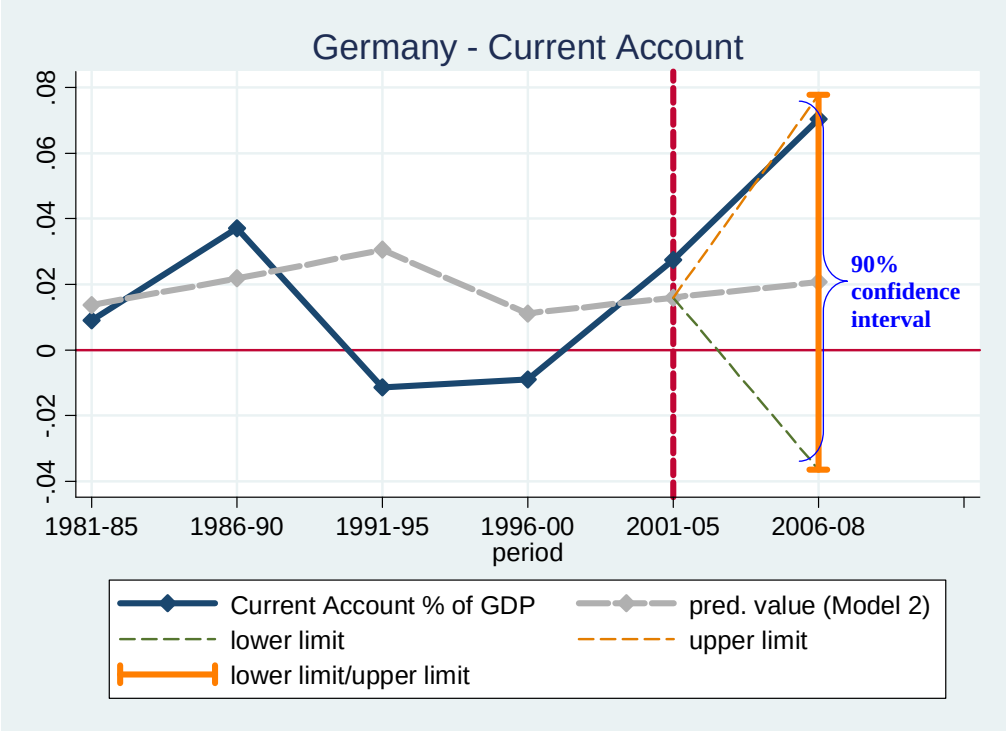
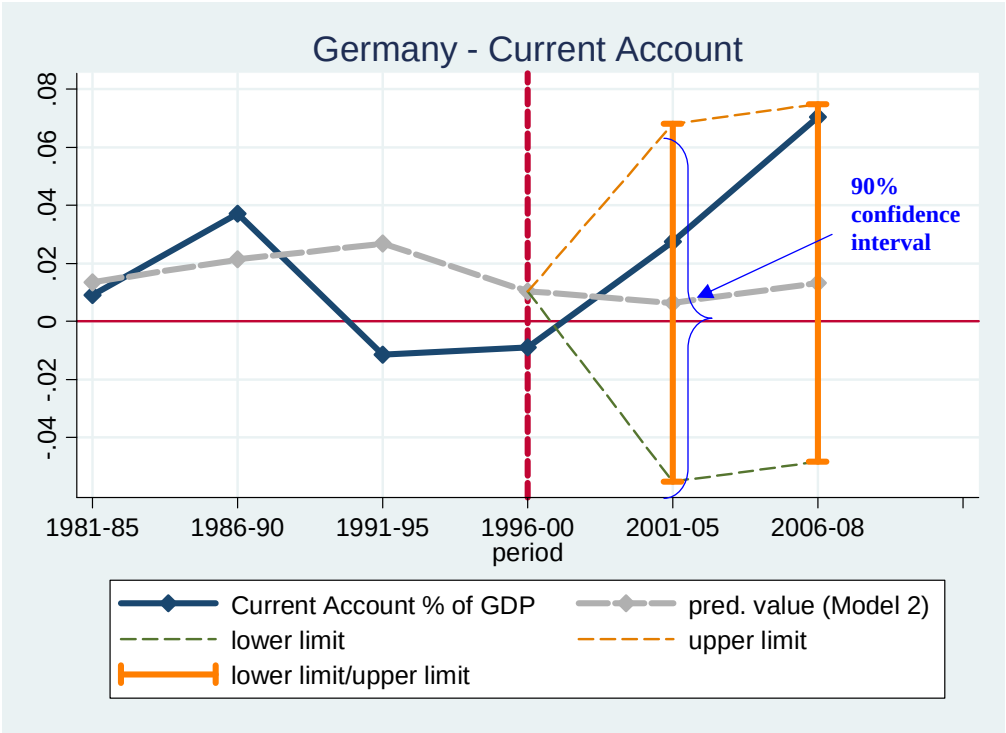


Figure 8: Estimating the Probability of a Current Account Balance Using the Pseudo-Confidence Interval of Forecast

(a) Retroactive Prediction Based on the Data up to 2005

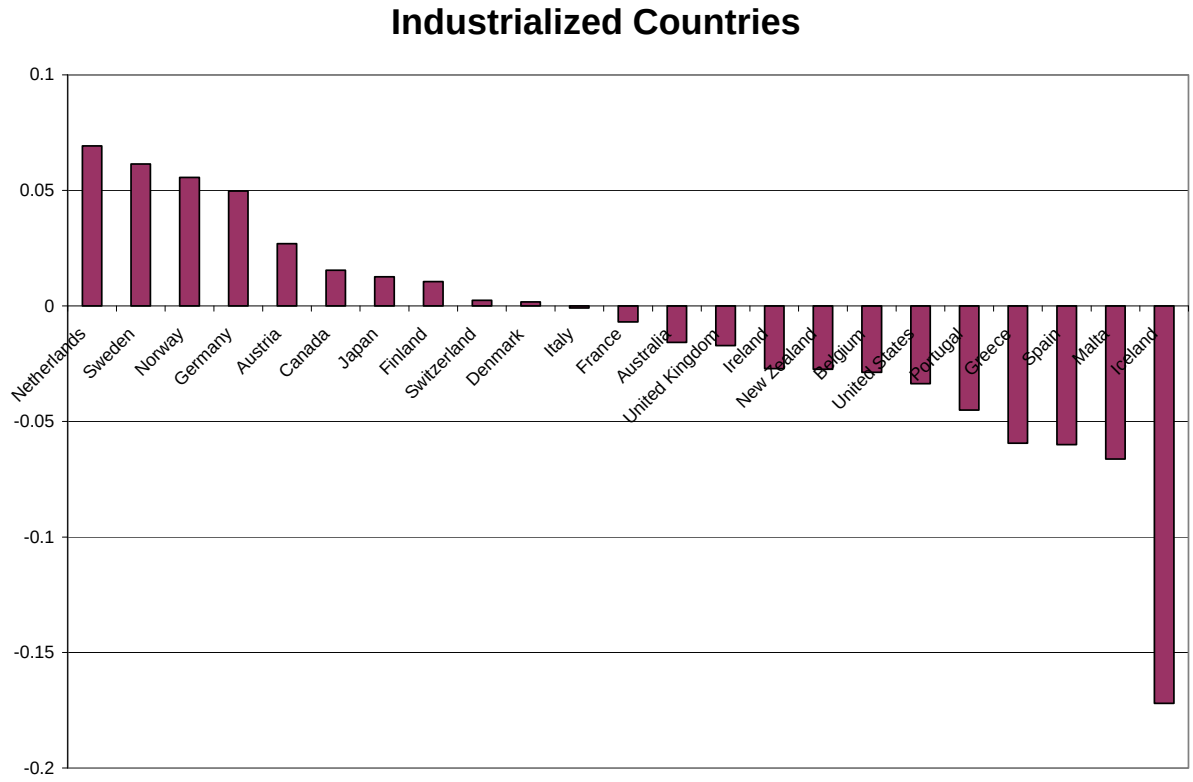


(b) Retroactive Prediction Based on the Data up to 2000



Note: The predictions for the periods 1971-75 and 1976-80 are omitted from presentation though they are included in the estimation.

Figure 9: Out-of-sample Predictions Errors for Current Account Balances in 2006-08



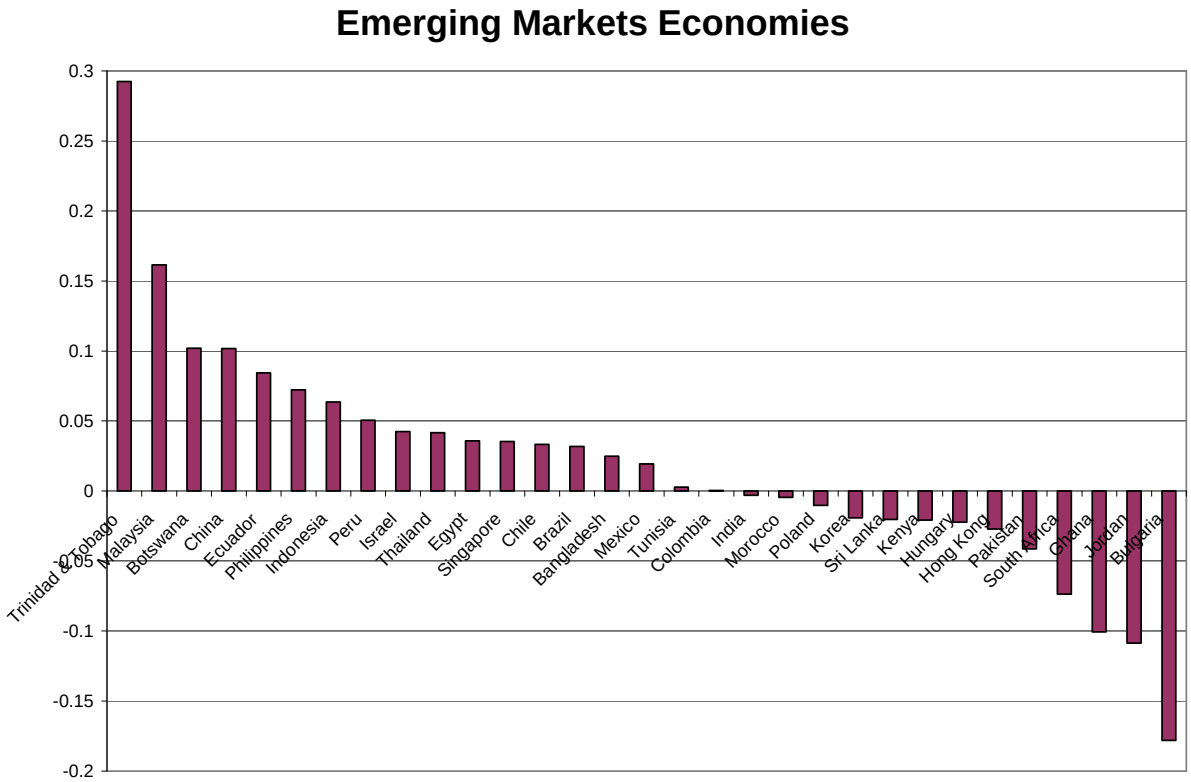
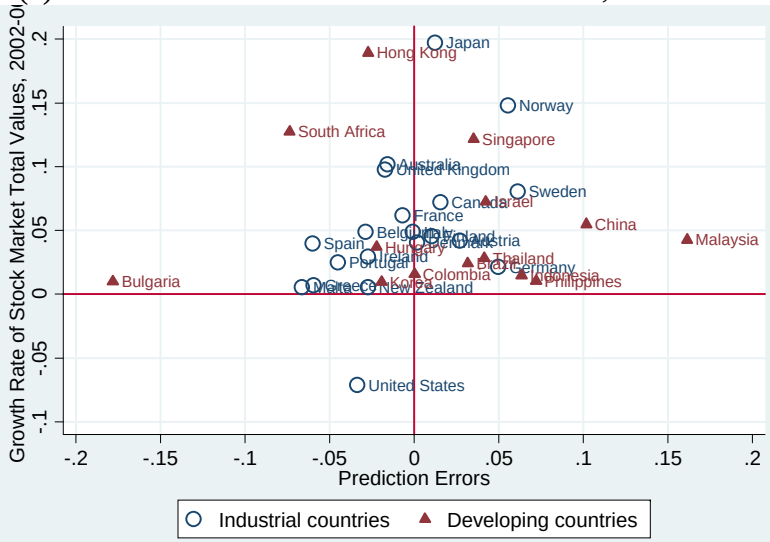


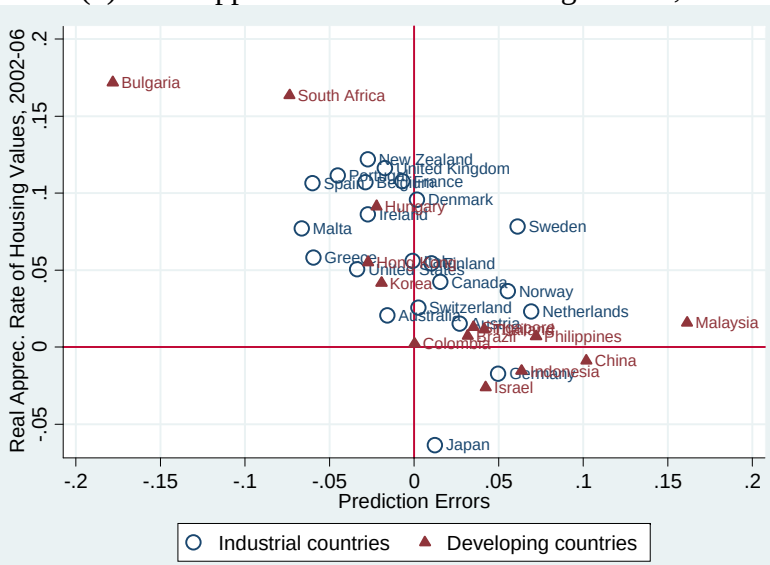
Figure 10: Prediction Errors vs. Real Appreciation Rate of Housing Values

(a) Growth Rate of Stock Market Total Value, 2002-06

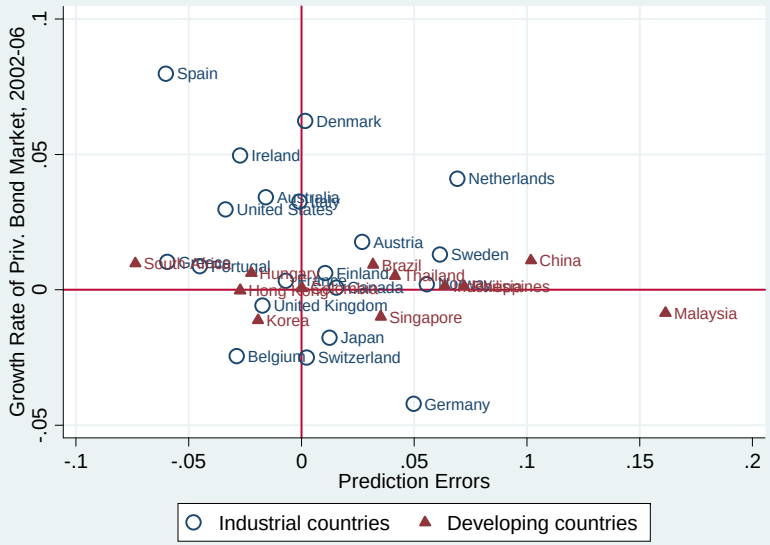


Switzerland and Netherlands are omitted since their SMTV changes are outliers

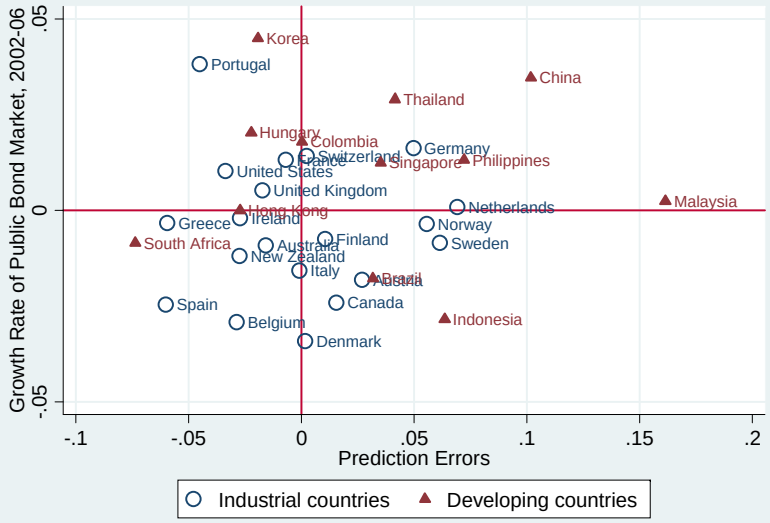
(b) Real Appreciation Rate of Housing Values, 2002-06



(c) Growth Rate of Private Bond Market Cap., 2002-06



(d) Growth Rate of Public Bond Market Cap., 2002-06



Japan is omitted since its PBBM change is an outlier

Figure 11: Forecasts of Current Account Balances for 2012-16 using data up to 2008 (red) or 2005 (grey)

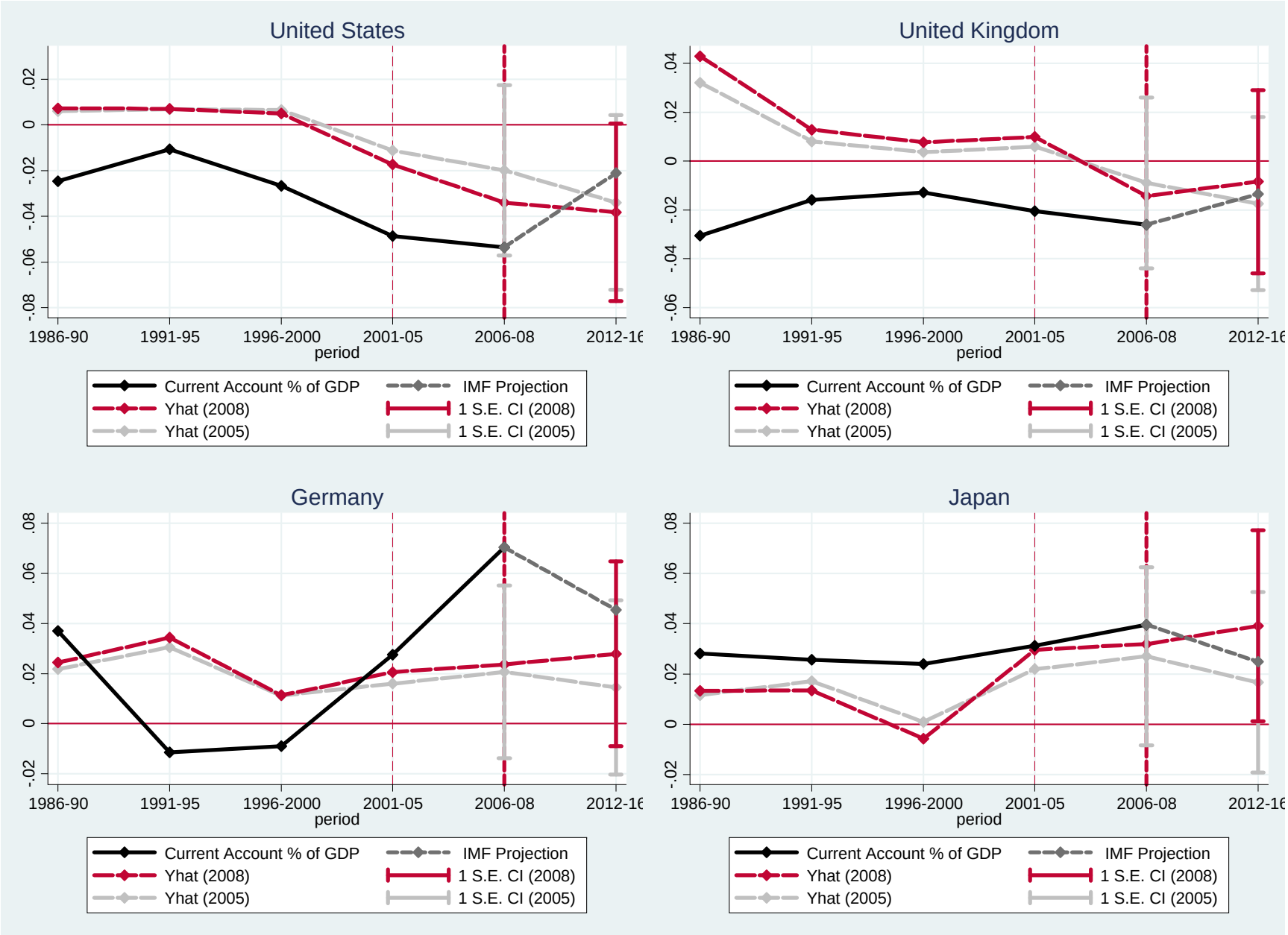


Figure 11 (continuted): Forecasts of Current Account Balances for 2012-16 using data up to 2008 (red) or 2005 (grey)

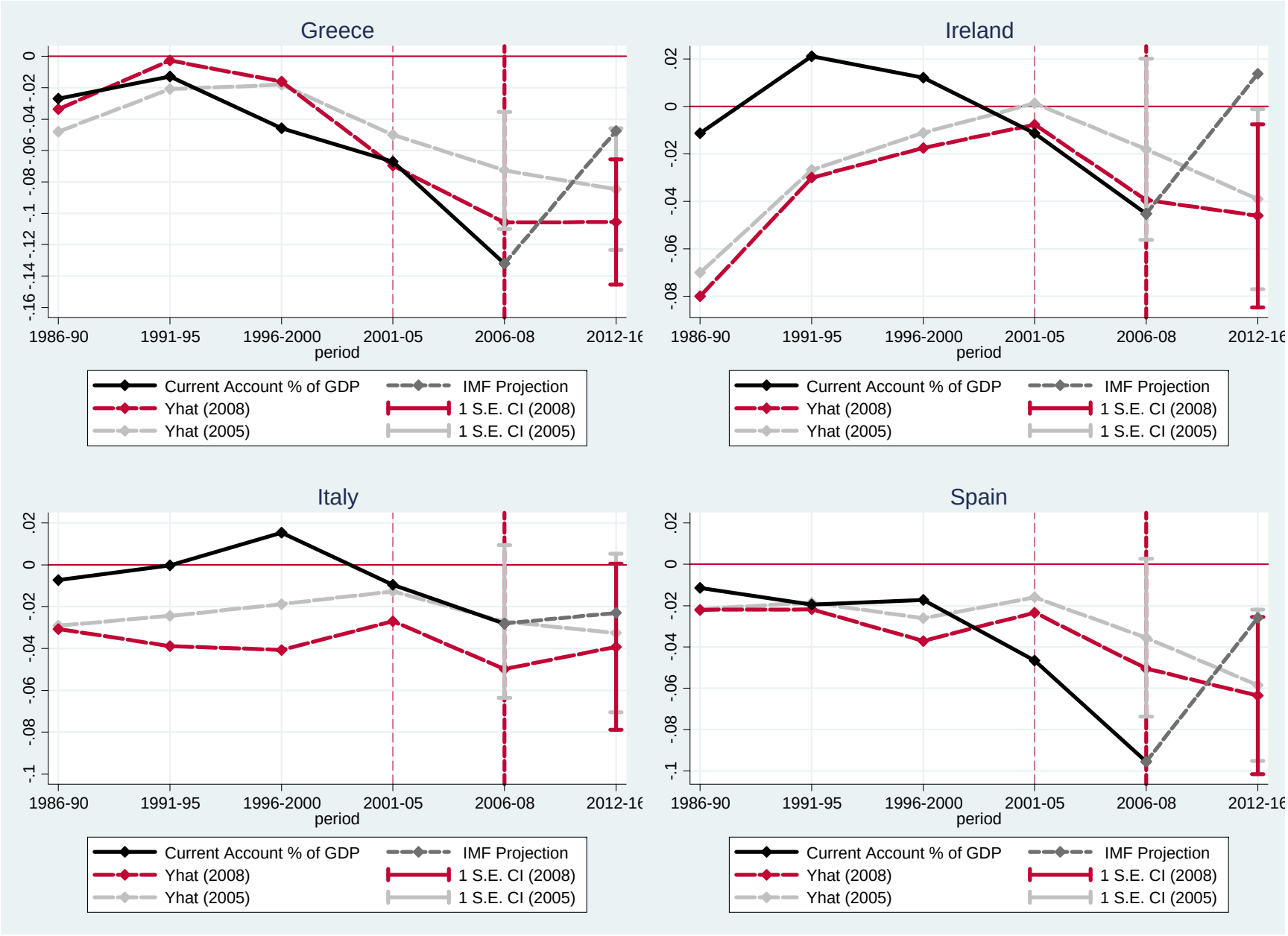


Figure 11 (continued): Forecasts of Current Account Balances for 2012-16 using data up to 2008 (red) or 2005 (grey)

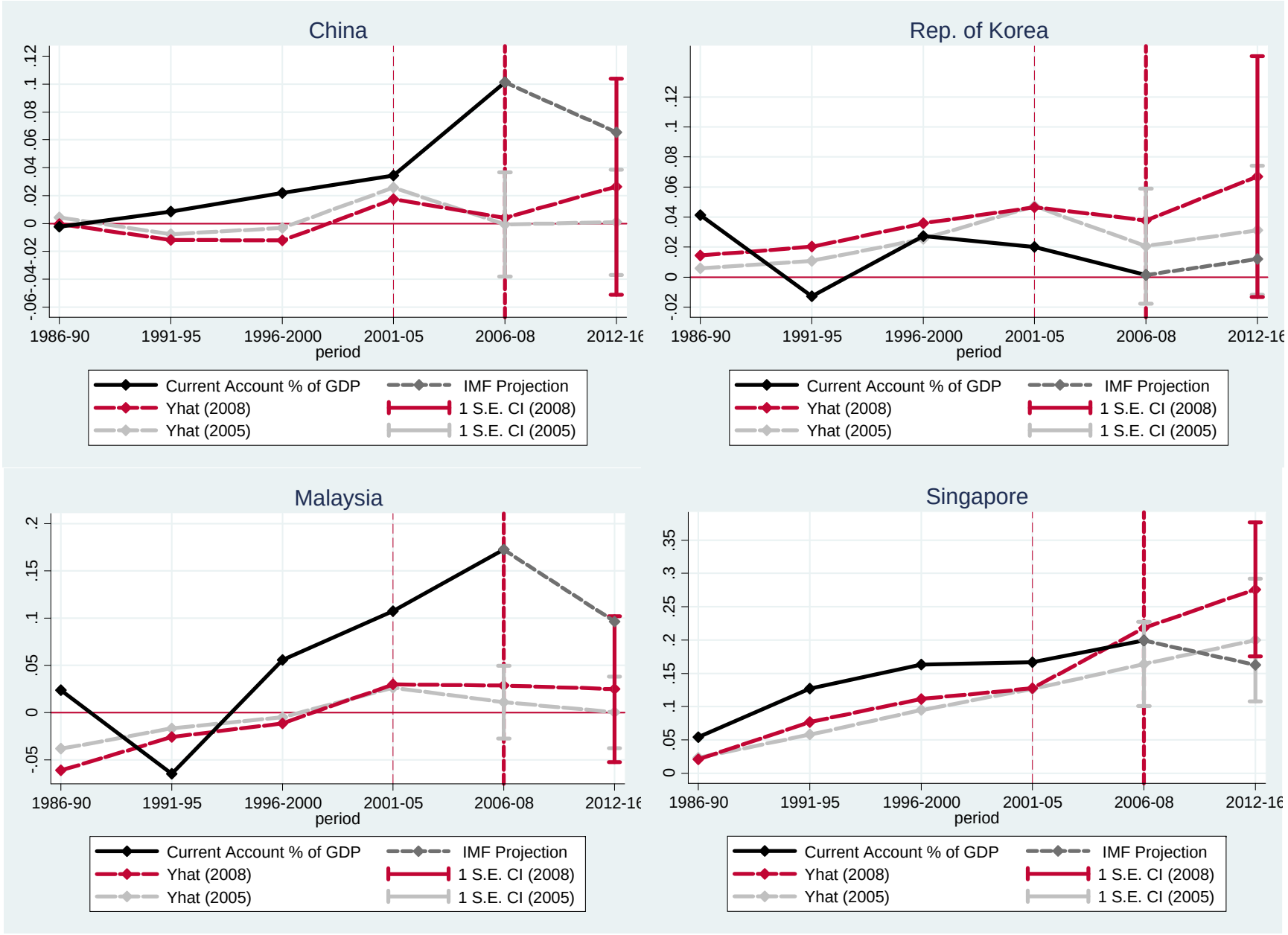


Figure 12: U.S. Current Account Projections for Optimistic and Pessimistic Scenarios

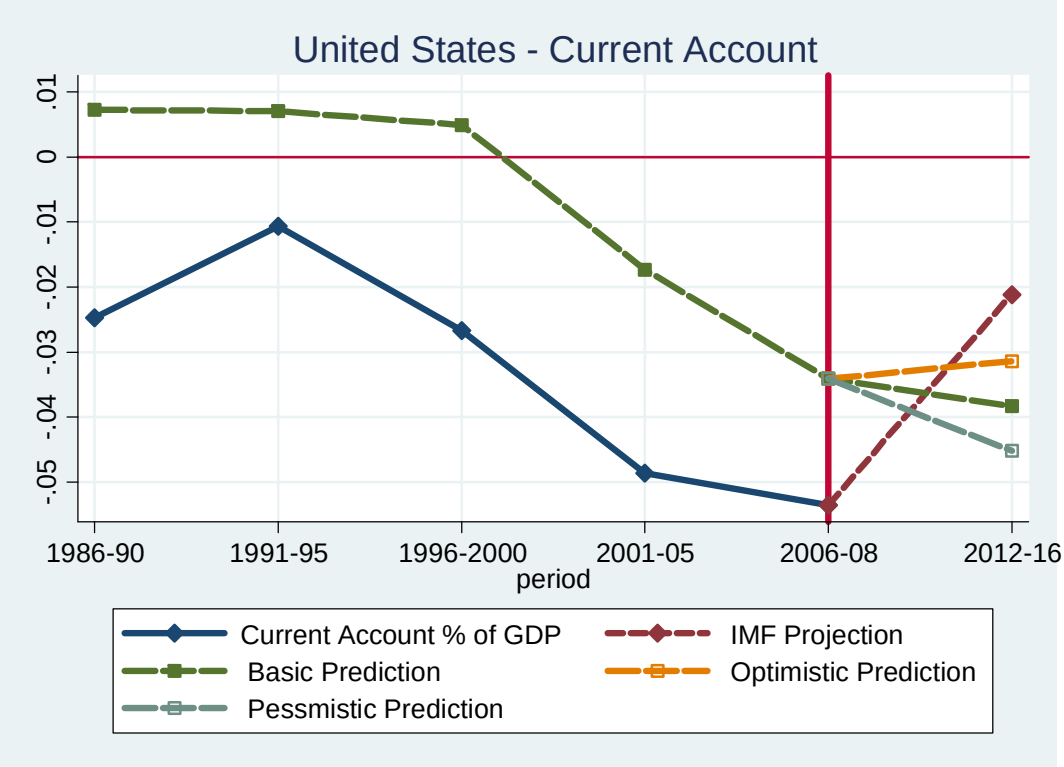


Figure 13: What if China Liberalizes Its Financial Markets

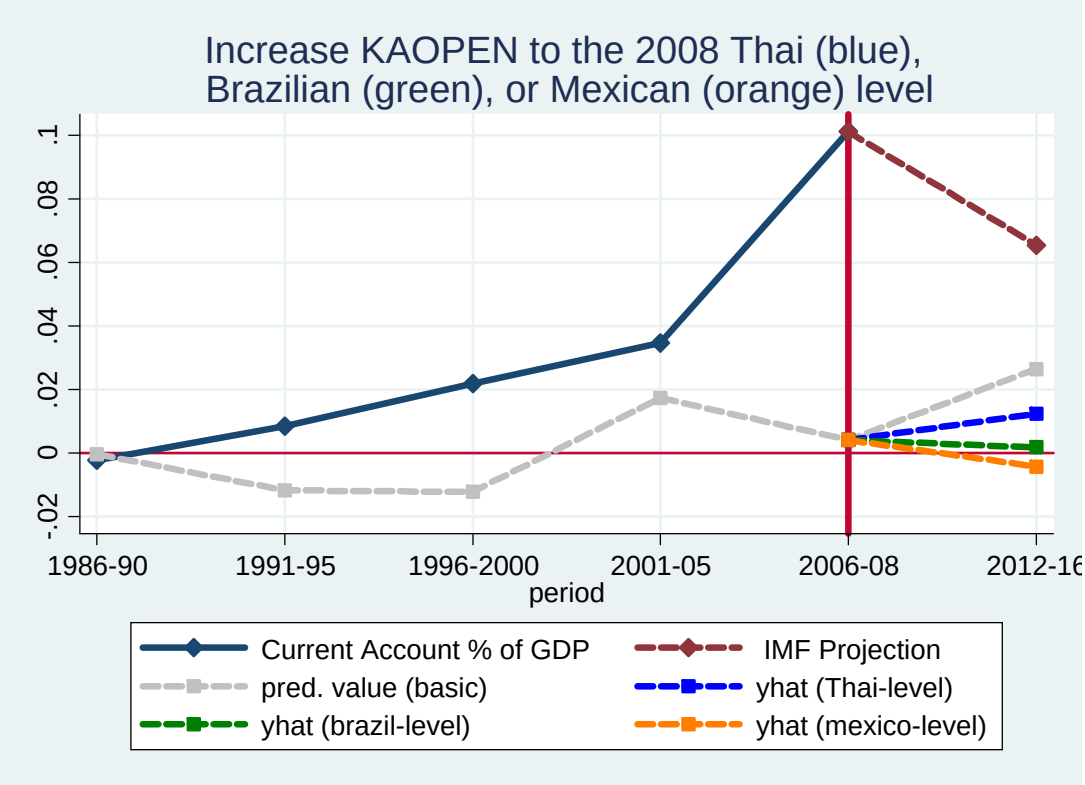


Figure 14: What if China both Develops and Liberalizes Its Financial Markets